

# **Missouri State Implementation Plan Progress Report**

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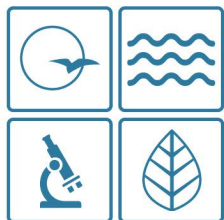
## **2025 Progress Report for The Second Regional Haze Planning Period**

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**Public Review  
December 30, 2024 – January 29, 2025**

**Missouri Department of Natural Resources  
Division of Environmental Quality  
Air Pollution Control Program  
Jefferson City, Missouri**



**MISSOURI**  
DEPARTMENT OF  
NATURAL RESOURCES

**Mike Kehoe**  
Governor

**Kurt U. Schaefer**  
Director

February 7, 2025

Jim Macy  
Regional Administrator  
U.S. EPA, Region VII  
11201 Renner Boulevard  
Lenexa, KS 66219

Re: State of Missouri 2025 Progress Report for the Second Regional Haze Planning Period

Dear Jim Macy:

The Missouri Department of Natural Resources' Air Pollution Control Program (air program) is submitting the state's 2025 Progress Report for the Second Regional Haze Planning Period pursuant to the requirements of 40 CFR part 51, Subpart P, Protection of Visibility. The progress report for the second planning period addresses the requirements of 40 CFR 51.308.

The progress report provides updates on the implementation of measures in Missouri's regional haze plan for the second planning period. It evaluates control measures, estimates emission reductions and trends, quantifies visibility progress, identifies impediments to progress, and assesses the strategy detailed in the plan for the second planning period. The evaluation demonstrates that Missouri's regional haze plan for the second planning period is achieving the established goals for visibility improvement and emissions reductions.

In accordance with 40 CFR 51.308(i), the air program made the draft progress report available for Federal Land Manager (FLM) consultation no less than 60 days prior to posting the report for public comment. The air program provided the draft progress report to the Federal Land Managers on October 17, 2024. The air program received comments from the U.S. Forest Service during the FLM consultation period. Appendix A of the progress report includes the comments received during the FLM consultation period and the air program's responses. The U.S. Fish and Wildlife Service and the National Parks Service provided no comments on the progress report during the FLM consultation period. In accordance with 40 CFR 51.308(g), following the FLM consultation period, the air program placed the draft progress report on public notice for 30 days starting on December 30, 2024. The air program received no comments during the 30-day public comment period for the progress report.

The air program is providing a searchable pdf version of this document through EPA's State Planning Electronic Collaboration System (SPECS). Additionally, the Air Program will post the complete submittal package on our website at <https://dnr.mo.gov/air/what-were-doing/state-planning/other-plans#RegionalHazePlan>.



Jim Macy

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The air program appreciates the assistance and cooperation provided by EPA Region VII during the formulation of this report. If you have any questions regarding this submittal, please contact Mr. Mark Leath with the Missouri Department of Natural Resources' Air Pollution Control Program at P.O. Box 176, Jefferson City, MO 65102 or by telephone at (573) 751-4817.

Sincerely,

AIR POLLUTION CONTROL PROGRAM

A handwritten signature in dark ink, appearing to read "Stephen M. Hall". The signature is fluid and cursive, with a long horizontal stroke extending from the end.

Stephen M. Hall  
Director

SMH: aas

Enclosure: 2025 Progress Report for the Second Regional Haze Planning Period and Appendices

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## **Executive Summary**

The purpose of this progress report is to address Missouri's requirements under 40 CFR 51.308(g), (h), and (i) for the Regional Haze Rule. The U.S. Environmental Protection Agency (EPA) Regional Haze Rule, codified at 40 CFR part 51, Subpart P, Visibility Protection, is designed to reduce visibility impairment from anthropogenic air pollution in 156 mandatory Class I Federal areas (Class I areas). Missouri has two Class I areas: Hercules-Glades Wilderness Area and Mingo National Wildlife Refuge. All states must submit progress reports on January 31, 2025, July 31, 2033, and every ten years after that. This progress report is for the second planning period. It provides updates on the implementation of measures in Missouri's regional haze plan for the second planning period. The Missouri Department of Natural Resources' Air Pollution Control Program (air program) submitted the plan to EPA on August 26, 2022.

This progress report satisfies these requirements by evaluating the status of control measures relied upon in Missouri's regional haze plan for the second planning period, estimating emissions reductions and trends, quantifying visibility progress, identifying impediments to progress, and assessing the strategy detailed in the plan. This evaluation demonstrates that Missouri's regional haze plan for the second planning period achieves established goals for visibility improvement and emissions reductions.

# **1. Introduction**

## *1.1 Regulatory Background*

On July 1, 1999, EPA promulgated the Regional Haze Rule to improve visibility in mandatory Class I areas. These areas include certain national parks (over 6,000 acres), wilderness areas (over 5,000 acres), national memorial parks (over 5,000 acres), and international parks that were in existence as of August 1977. Haze obscures the clarity, color, texture, and form of what people see. Because the fine particles that create haze travel long distances, the rule requires all states to develop coordinated strategies and implement programs to make reasonable progress toward the goal of no manmade visibility impairment in national parks and wilderness areas by reducing emissions that contribute to haze. Regional planning organizations assist states in addressing visibility from a regional perspective.

The rule aims to achieve natural visibility conditions in all Class I areas by 2064. The rule requirements are codified in 40 CFR part 51 Subpart P, Protection of Visibility. Currently, the rule requires states to submit two types of documents. Section 51.308(f) requires states to submit state implementation plans (plans) starting in 2018 and every ten years. These plans must include long-term strategies and interim goals to demonstrate progress toward reducing visibility impairment in Class I areas. The air program satisfied the state planning requirements for the first period and submitted the plan to EPA for the second planning period. Section 51.308(g) requires states to submit progress reports at the mid-point of the plan period. The progress reports must include an evaluation of and, if necessary, mid-course corrections to the plans. The air program satisfied the progress report requirements for the first planning period. This report addresses the progress report requirements for the second planning period.

## *1.2 Class I Areas*

Class I areas are managed by the National Park Service, U.S. Fish and Wildlife Service, U.S. Forest Service, and several Native American Tribes and comprise 156 national parks and wilderness areas. Figure 1 shows the Class I areas.

Figure 1: Federal Class I Areas in the U.S.



### 1.3 Class I Areas in Missouri

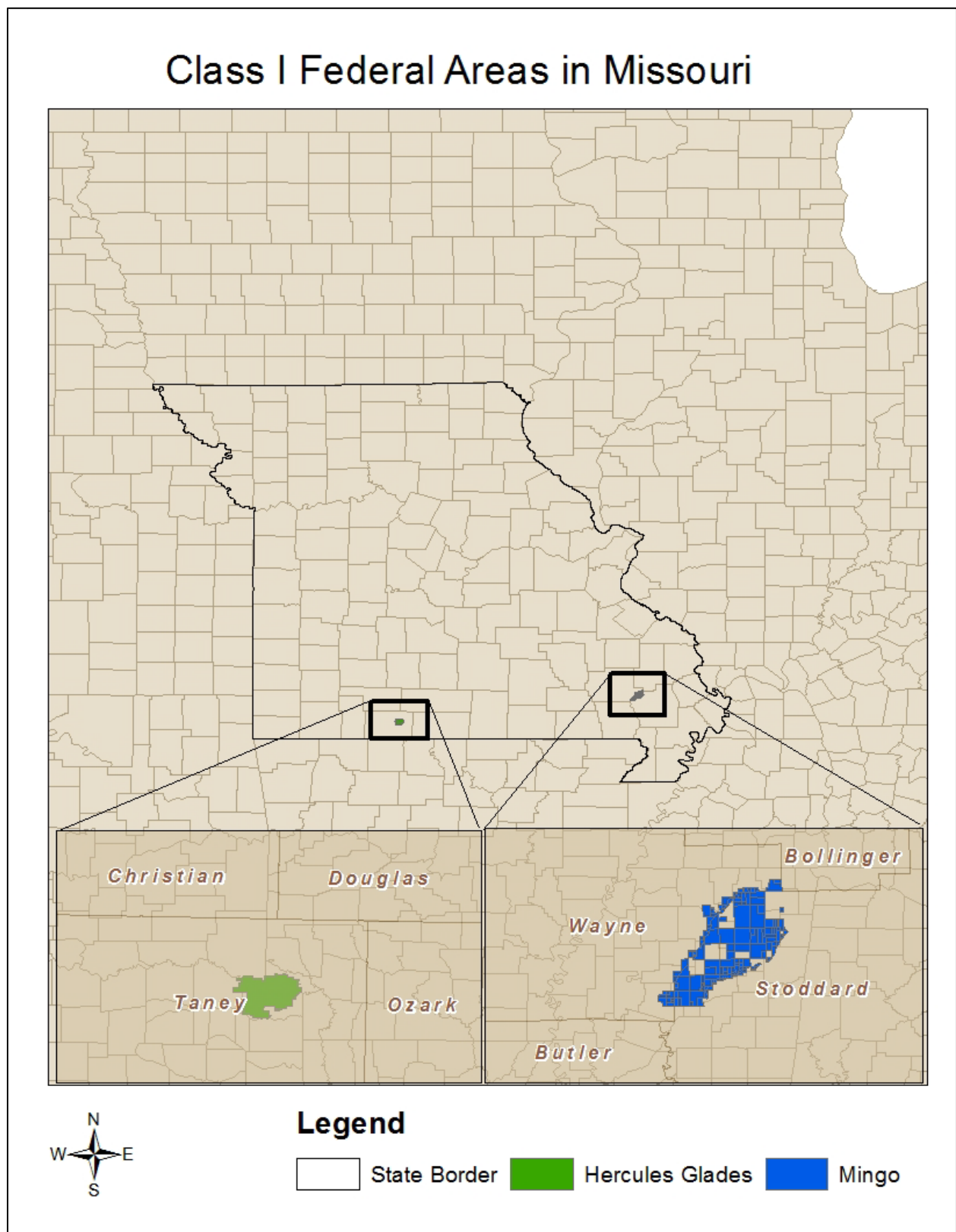
Figure 2 shows a close-up of Missouri's two Class I areas:

- Hercules-Glades Wilderness Area
- Mingo National Wildlife Refuge

The Hercules-Glades Wilderness Area is in Taney County in southwest Missouri. The Hercules-Glades Wilderness Area is part of the Mark Twain National Forest and is managed by the United States Department of Agriculture Forest Service. The area includes 12,315 acres located in the Missouri Ozarks. The closest urban area is the Springfield/Branson metropolitan statistical area, 40 miles to the west/northwest.

The Mingo National Wildlife Refuge is in southeast Missouri along the Mississippi Flyway. The U.S. Fish and Wildlife Service manages the refuge. Only a portion of the refuge is a Class I area (7,730 acres of 21,676 acres). The two largest nearby urban areas are Memphis to the south and St. Louis to the north.

Figure 2: Class I Areas in Missouri



#### 1.4 Regional Planning Organizations

Regional planning organizations contribute to air quality management in various ways, including regional haze. Because the emissions that contribute to regional haze can come from sources across broad geographic areas, the EPA encourages states and tribes to collaborate and address visibility impairment from a regional perspective. Regional planning organizations evaluate technical information to understand how the states and tribes in their area impact Class I areas. They develop regional strategies to reduce emissions that contribute to regional haze. They provide technical assistance, facilitate discussions, encourage coordinated action among their member agencies, and foster communication with other regional planning organizations. Figure 3 contains a map of the regional planning organizations.

Figure 3: Regional Planning Organizations

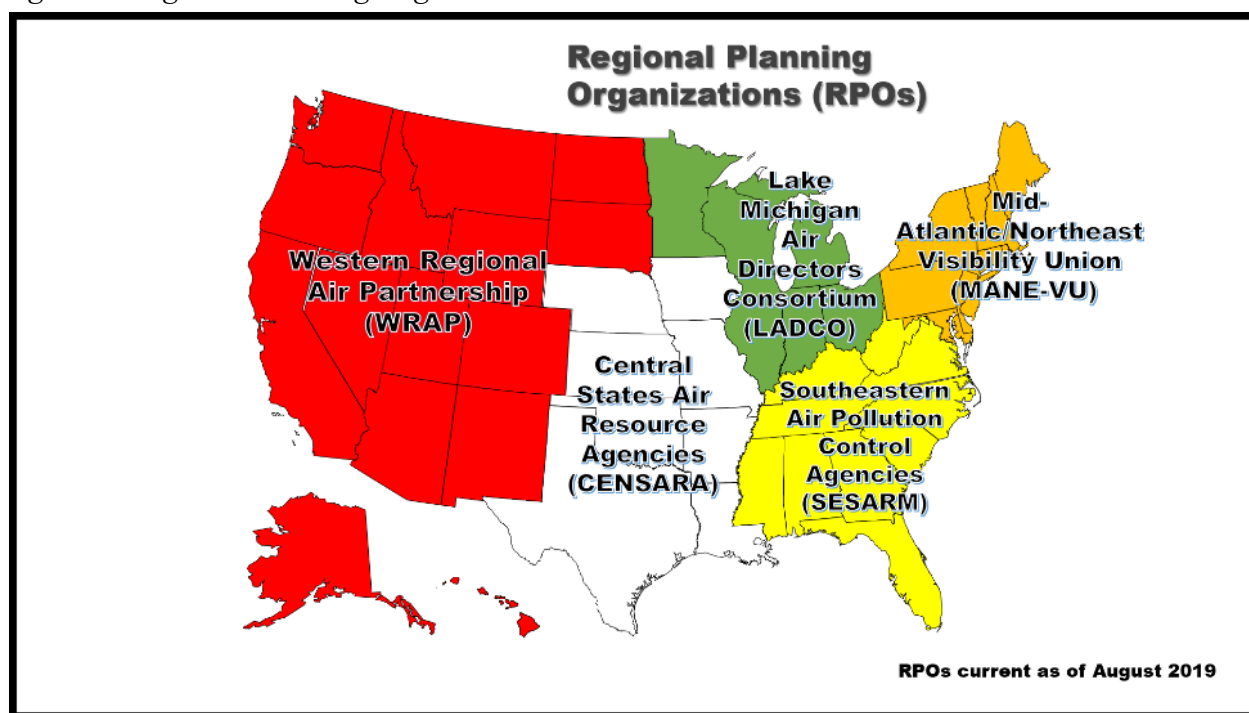
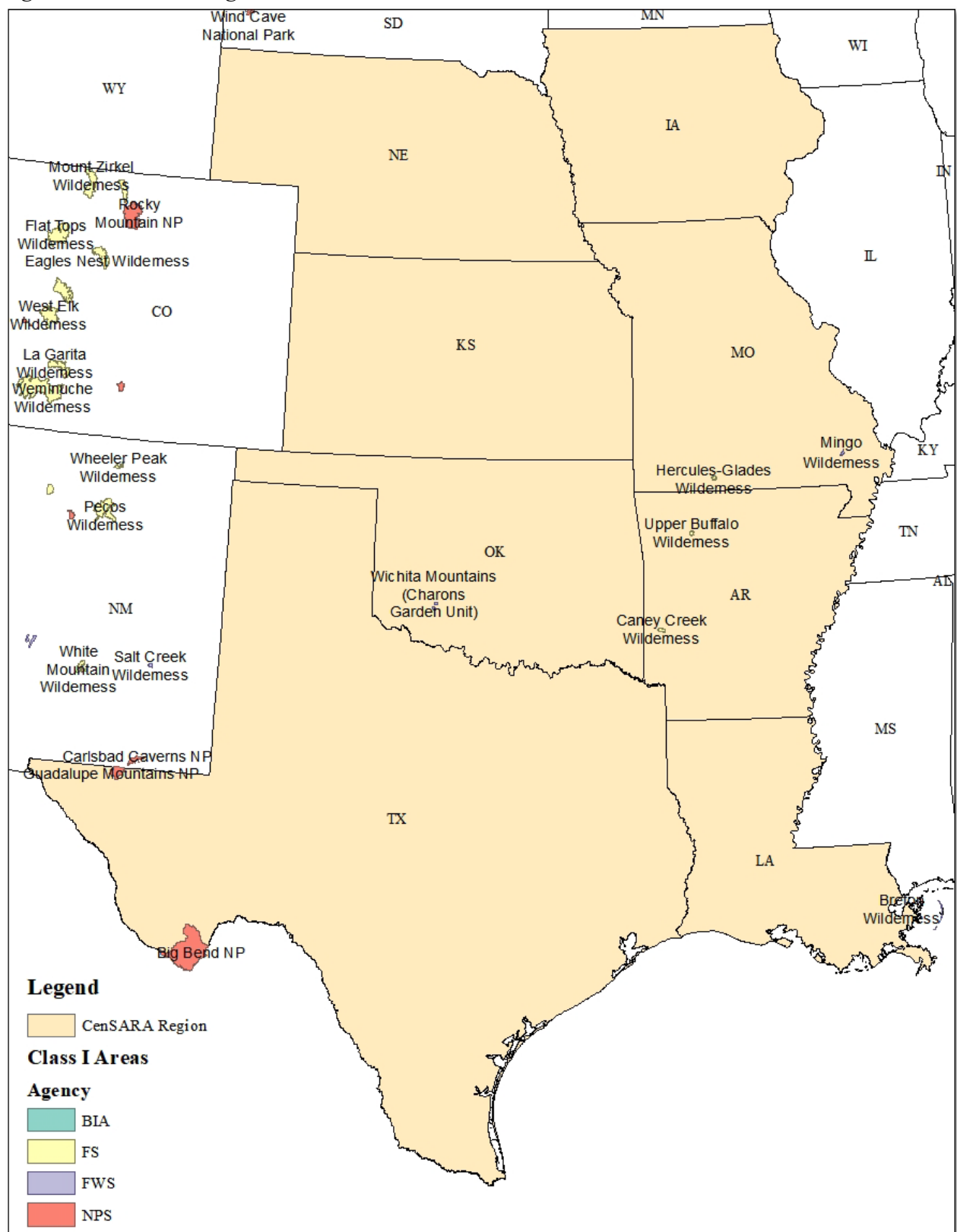


Figure 3 shows that Missouri is a Central States Air Resource Agencies (CenSARA) regional planning organization member. CenSARA's membership includes eight states: Arkansas, Iowa, Kansas, Louisiana, Missouri, Nebraska, Oklahoma, and Texas. Additional CenSARA members include EPA, the U.S. Fish and Wildlife Service, the U.S. Forest Service, and the U.S. National Park Service. The CenSARA region contains eight Class I areas. These Class I areas are listed below and shown in Figure 4.

- Hercules-Glades Wilderness Area, Missouri
- Mingo National Wildlife Refuge, Missouri
- Upper Buffalo Wilderness Area, Arkansas
- Caney Creek Wilderness, Arkansas
- Wichita Mountains Wilderness, Oklahoma

- Big Bend National Park, Texas
- Guadalupe Mountains National Park, Texas
- Breton Wilderness Area, Louisiana

Figure 4: CenSARA Region and Class I Areas





### *1.5 The First Planning Period, 2008-2018*

On June 15, 2005, EPA amended the regional haze rule, changing the requirements for emission controls known as Best Available Retrofit Technology (BART) for industrial facilities emitting air pollutants that reduce visibility. These pollutants include particulate matter less than 2.5 microns (PM<sub>2.5</sub>) and compounds that contribute to PM<sub>2.5</sub> formation,<sup>1</sup> such as nitrogen oxides, sulfur dioxides, specific volatile organic compounds, and ammonia. The amendments include final guidelines, known as BART guidelines, for states to determine which facilities must install controls and the type of controls the facilities must use.

On October 13, 2006, EPA finalized an alternative emissions trading program that provided states with flexibility in applying BART. The BART requirements would be satisfied if the trading program meets or exceeds the visibility benefits of BART.

On July 29, 2009, the air program submitted the regional haze plan to EPA for the first planning period, covering 2008 to 2018. The plan included a BART analysis and a uniform rate of progress analysis to satisfy rule requirements.

On February 3, 2012, the air program supplemented the 2009 plan. The supplement contained additional information and support for the four-factor analysis and reasonable progress goal, the BART analysis, and data for the natural conditions on the best 20 percent visibility days.

On June 7, 2012, EPA published a limited disapproval of the 2009 plan.<sup>2</sup> This same rulemaking also determined that state participation in the federal Cross-State Air Pollution Rule (CSAPR) Trading Programs achieve greater reasonable progress toward the national goal of achieving natural visibility conditions in Class I areas than source-specific BART in those states. Therefore, the rule allowed states to rely on participation in CSAPR to address NO<sub>x</sub> and SO<sub>2</sub> BART requirements at electric generating units. The limited disapproval of the action was because the 2009 plan relied on requirements of the Clean Air Interstate Rule (CAIR)<sup>3</sup> to satisfy BART requirements for NO<sub>x</sub> and SO<sub>2</sub> at electric generating units in the state. Finally, in this same rulemaking, EPA promulgated a federal implementation plan in Missouri to replace reliance on CAIR with reliance on CSAPR to address NO<sub>x</sub> and SO<sub>2</sub> BART requirements for electric generating units in the state.

On June 26, 2012, EPA published a limited approval of the 2009 plan and the 2012 plan supplement.<sup>4</sup> The EPA granted limited approval because the plan met all the requirements of the Regional Haze Rule, except for the NO<sub>x</sub> and SO<sub>2</sub> BART requirements for electric generating units due to the state's reliance on CAIR instead of CSAPR in the plan.

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<sup>1</sup> Particulate Matter (PM) Pollution, <https://www.epa.gov/pm-pollution>

<sup>2</sup> 77 FR 33642; <https://www.govinfo.gov/content/pkg/FR-2012-06-07/pdf/2012-13693.pdf>

<sup>3</sup> EPA established CAIR on March 10, 2005. In 2008, through multiple court actions, the D.C Circuit court vacated the rule, returning responsibility to EPA to create a rule consistent with the court's opinion. EPA replaced CAIR with the CSAPR on July 6, 2011. CSAPR implementation began on January 1, 2015.

<sup>4</sup> 77 FR 38007; <https://www.govinfo.gov/content/pkg/FR-2012-06-26/pdf/2012-15021.pdf>

On August 29, 2014, the air program submitted the progress report for the first planning period. The report analyzed the strategy of the 2009 plan and 2012 plan supplement. The report satisfied the 40 CFR 51.308(g) requirements and followed the guidelines in EPA's April 2013 guidance document.<sup>5</sup> The 2014 progress report concluded that the strategy contained in the 2009 plan and 2012 plan supplement continued to be sufficient to achieve the goals detailed in the rule, and no additional controls or further revision of the 2009 plan and 2012 plan supplement were necessary.

On August 1, 2016, EPA approved the 2014 progress report and determined that the 2009 plan and 2012 plan supplement adequately met the visibility goals and required no substantive revision at that time.<sup>6</sup>

On July 31, 2017, the air program submitted a supplement for the following three items: the 2014 progress report, the 2009 plan, and the 2012 supplement. The supplement provided clarification on two items. For all three submissions, the state elected to use the option allowed under 40 CFR 51.308(e)(4) to rely on the CSAPR federal implementation plans to satisfy the NO<sub>x</sub> and SO<sub>2</sub> BART requirements for units in Missouri that are subject to the trading programs, and also to meet the reasonable progress requirements of 40 CFR 51.308(d)(3).

On September 24, 2018, EPA finalized several actions in a single rulemaking regarding the 2009 plan, the 2012 plan supplement, the 2014 progress report, and the 2017 supplement, including:<sup>7</sup>

- Approving the portion of the 2014 progress report and the 2017 supplement that relied on CSAPR instead of CAIR to satisfy rule requirements;
- Converting EPA's limited approval/limited disapproval of the 2009 plan and 2012 supplement to a full approval and
- Withdrawing the June 7, 2012, federal implementation plan in Missouri.
- The EPA rule also approved several Missouri infrastructure State Implementation Plans (SIPs) as meeting the Prong 4 (Visibility) requirements of CAA Section 110(a)(2)(D)(i)(II), which prohibits emissions activity in one state from interfering with measures to protect visibility in another state. These infrastructure SIPs included Missouri's plans for the 2012 PM<sub>2.5</sub> standard, the 2010 NO<sub>2</sub> standard, the 2010 SO<sub>2</sub> standard, and the 2008 Ozone standard.

## *1.6 The Second Planning Period, 2018-2028*

On January 10, 2017, EPA revised the Regional Haze rule<sup>8</sup> to address requirements for the second planning period, 2018-2028, as listed below:

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<sup>5</sup> "General Principles for the 5-Year Regional Haze Progress Reports for the Initial Regional Haze State Implementation Plans," [http://www.4cleanair.org/Documents/haze\\_5year\\_4-10-13.pdf](http://www.4cleanair.org/Documents/haze_5year_4-10-13.pdf)

<sup>6</sup> 81 FR 50351; <https://www.govinfo.gov/content/pkg/FR-2016-08-01/pdf/2016-17785.pdf>

<sup>7</sup> 83 FR 48242 also includes EPA actions on Missouri plans for the 2008 Ozone, 2010 Nitrogen Dioxide, 2010 Sulfur Dioxide, and 2012 Fine Particulate Matter standards. <https://www.govinfo.gov/content/pkg/FR-2018-09-24/pdf/2018-20615.pdf>.

<sup>8</sup> See 82 FR 3078; <https://www.govinfo.gov/content/pkg/FR-2017-01-10/pdf/2017-00268.pdf>

- Clarified the relationship between long-term strategies and reasonable progress goals in plans and the long-term strategy obligations of all states.
- Clarified and modified plan and progress report requirements. Made a one-time adjustment to the due date for the next plan by extending the existing deadline of July 31, 2018, to July 31, 2021. Subsequent progress reports are due by January 31, 2025, July 31, 2033, and every ten years after that, meaning a progress report is required mid-way through each ten-year planning period.
- Modified the days used to track progress toward natural visibility conditions to account for events such as wildfires.
- Provided states additional flexibility to address impacts on visibility from manmade sources outside the United States and from certain types of prescribed fires.
- Updated the provisions for reasonably attributable visibility impairment and revoked most existing reasonably attributable visibility impairment federal implementation plans.
- Changed the method to track progress during the second planning period to select and analyze 20 percent of the sample days from each year with the highest manmade visibility impairment at each Class I area.

On August 26, 2022, the air program submitted the regional haze plan for the second planning period. The plan contains strategies to ensure progress toward regional haze goals. It confirms this progress by using EPA's 2028 Regional Haze Modeling to project visibility conditions at the end of the second planning period. According to the model, visibility projections for Missouri's Class I areas are less than their respective uniform rate of progress, meeting the visibility goals for the second planning period. On July 3, 2024, EPA proposed to partially approve and partially disapprove the 2022 plan.<sup>9</sup>

## **2. Clean Air Act Section 169A and 169B and Regional Haze Rule Requirements**

Clean Air Act sections 169A and 169B establish the framework of visibility protection in Class I areas. The EPA codified the Regional Haze Rule in 40 CFR part 51, Subpart P, Protection of Visibility, establishing requirements to implement the Clean Air Act framework. The rule applies to all states as defined in Clean Air Act section 302(d) except Guam, Puerto Rico, American Samoa, and the Northern Mariana Islands. The rule creates requirements addressing visibility impairment in two principal forms: reasonably attributable impairment and regional haze. Reasonably attributable impairment is impairment attributable to a single source/small group of sources. Regional haze is widespread haze from many sources that impairs visibility in every direction over a large area. This progress report complies with the rule's requirements and follows EPA's July 2024 guidance document "Overview of Elements for the Regional Haze Second Planning Period State Implementation Plan Progress Reports Due in 2025."<sup>10</sup>

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<sup>9</sup> EPA proposed to partially approve and partially disapprove Missouri's Regional Haze Plan for the Second Planning Period, see 89 FR 55140, July 3, 2024, <https://www.govinfo.gov/content/pkg/FR-2024-07-03/pdf/2024-14612.pdf>

<sup>10</sup>[https://www.epa.gov/system/files/documents/2024-07/final\\_rh\\_2025\\_progress\\_report\\_requirements\\_document\\_7-30-2024.pdf](https://www.epa.gov/system/files/documents/2024-07/final_rh_2025_progress_report_requirements_document_7-30-2024.pdf)

Progress reports must meet the requirements of 40 CFR 51.308(g), Public Comment, 40 CFR 51.308(h), Determination of Adequacy, and 40 CFR 51.308(i), Federal Land Manager Consultation. Progress reports are not formal state plan revisions and do not have to meet the requirements in 40 CFR 51.102, public hearings, and 51.103, submissions conforming to 40 CFR part 51 Appendix V.

40 CFR 51.308(g) requires the air program to make the draft progress report available for public comment, consistent with the air program's public comment process, for at least 30 days. The air program must submit all public comments to EPA, along with an explanation of any changes made to the report in response to public comments.

40 CFR 51.308(g)(1) requires a description of the implementation status of all measures included in Missouri's Regional Haze SIP, including the first and second planning periods, for achieving reasonable progress goals for Class I areas within and outside Missouri. This section includes a description of new and existing emissions limits or control measures implemented in the 2022 plan that were determined to be necessary for reasonable progress, as well as a description of limits or control measures that continue to be implemented from the first planning period. This section also discusses whether the applicable compliance date has been met for each source regulated by Missouri's Regional Haze SIP.

40 CFR 51.308(g)(2) requires a summary of the emission reductions achieved within Missouri through the implementation of the measures described in 40 CFR 51.308(g)(1). This section identifies and estimates emission reductions of visibility-impairing pollutants from the measures listed in 40 CFR 51.308(g)(1). This includes all measures relied upon by the air program in 40 CFR 51.308(g)(1) to achieve reasonable progress toward the national visibility goal, regardless of whether the measures were in place during the first or second planning period. This section demonstrates how emission reduction measures have improved visibility in the Class 1 areas impacted by emissions from Missouri. Because electric generating unit strategies are included in 40 CFR 51.308(g)(1), this section identifies the sources reporting to EPA's Clean Air and Power Division and discusses emission trends for Missouri using the latest information from EPA's Clean Air and Power Division database.

40 CFR 51.308(g)(3) applies to states containing Class I areas. Missouri contains two Class I areas; therefore, this section applies and requires the air program to assess the following visibility conditions and changes, with values for most impaired, least impaired, and clearest days, as applicable, expressed in terms of 5-year averages of these annual values. The period for calculating current visibility conditions is 2018-2022 data. This section calculates the difference between "current visibility conditions for the most impaired days," "current visibility conditions for the clearest days," and "baseline visibility conditions," using the baseline values from the 2022 plan.

40 CFR 51.308(g)(4) requires an analysis tracking the change since the 2022 plan in emissions of pollutants contributing to visibility impairment from all sources and activities within Missouri. This section identifies emission changes by type of source or activity and extends through the most recent National Emissions Inventory year of 2023 for sources that report emissions to

Missouri. For sources that report emissions to EPA's Clean Air and Power Division, the analysis extends through the most recent year data is available, 2023.

40 CFR 51.308(g)(5) requires an assessment of any significant changes in manmade emissions within or outside of Missouri since the 2022 plan. This section discusses whether the 2022 plan anticipated these changes and whether these changes have limited or impeded progress in reducing pollutant emissions and improving visibility. A significant change that limits or impedes progress could be either (1) a significant unexpected increase in manmade emissions that occurred since the 2022 plan and was not initially projected in the 2022 plan modeling analysis or (2) a significant expected reduction in manmade emissions that did not occur as expected in the 2022 plan.

40 CFR 51.308(g)(6) requires an assessment of whether the 2022 plan elements and strategies are sufficient to enable Missouri and other states with Class 1 areas affected by emissions from Missouri to meet all established reasonable progress goals for the 2022 plan. The section evaluates both the ambient visibility monitoring data and emissions trends to determine if Missouri's Class 1 areas and Class 1 areas in other states affected by emissions from Missouri are expected to meet their 2028 reasonable progress goals. This section evaluates the most recent visibility monitoring ambient data and compares it to applicable ambient data to evaluate ongoing visibility trends. This section lists each Class 1 area in other states affected by emissions from Missouri, as identified in the 2022 plan. For these areas, this section assesses qualitatively whether the emissions and visibility trends in Missouri suggest any deficiencies in Missouri's Regional Haze plan that will affect the achievement of the reasonable progress goals for those outstate Class 1 areas. This section also looks forward to 2028 and presents a qualitative assessment of progress expected by the end of, but not beyond, 2028.

40 CFR 51.308(g)(7) applies to progress reports for the first planning period. This progress report is for the second planning period; therefore, §51.308(g)(7) does not apply

40 CFR 51.308(g)(8) applies to plans with a long-term strategy that includes a smoke management program. Missouri's Smoke Management Plan was included for reference in the 2022 plan but was not submitted as part of the state implementation plan. Therefore, §51.308(g)(8) does not apply.

40 CFR 51.308(h), Determination of Adequacy, requires the air program to analyze information on emissions and ambient data and trends. Based on the analysis, the air program must determine the adequacy of the 2022 plan. Because Missouri contains Class I areas, the air program must choose one of the following four options:

1. If the air program determines that the 2022 plan requires no further substantive revision at this time to achieve established goals for visibility improvement and emissions reductions, the air program must provide to EPA a declaration that revision of the existing implementation plan is not needed at this time.
2. If the air program determines that the 2022 plan is, or may be, inadequate to ensure reasonable progress due to emissions from sources in another state(s) that participated in a regional planning process, the air program must notify EPA and those other state(s).

The air program must also collaborate with those other state(s) through the regional planning process to develop additional strategies to address the plan's deficiencies.

3. If the air program determines that the 2022 plan is, or may be, inadequate to ensure reasonable progress due to emissions from sources in another country, the air program shall provide notification, along with available information, to EPA.
4. If the air program determines that the 2022 plan is, or may be, inadequate to ensure reasonable progress due to emissions from sources within Missouri, the air program shall revise the plan to address the deficiencies within one year.

40 CFR 51.308(i), Federal Land Manager Consultation, requires the air program to make the draft progress report available to the Federal Land Managers no less than 60 days before the air program's public comment period. The air program must describe how it addressed the Federal Land Manager's comments after the consultation period in the progress report.

Table 1 lists the requirements that apply to this progress report and the sections of the report addressing each requirement.

*Table 1: Progress Report Organization*

<b>40 CFR 51.308</b>	<b>Progress Report Section</b>	<b>Description</b>
(g)	5	Public comment
(g)(1)	3.1	Status of implementation of control measures in the 2022 plan
(g)(2)	3.2	Emissions reductions achieved throughout the state from implementing the measures in the 2022 plan
(g)(3)	3.3	Assessment of Visibility conditions using the baseline values from the 2022 plan
(g)(4)	3.4	Analysis tracking emissions changes since the 2022 plan
(g)(5)	3.5	Assessment of changes in anthropogenic emissions since the 2022 plan
(g)(6)	3.6	Assessment of the 2022 plan elements and strategy to meet reasonable progress goals
(h)	3.7	Determination of adequacy of the 2022 plan
(i)	4	Federal Land Manager consultation

### **3. Missouri's 2025 Progress Report**

#### *3.1 Status of implementation of control measures in the 2022 plan*

40 CFR 51.308(g)(1) requires a description of the implementation status of all measures included in Missouri's Regional Haze SIP, including the first and second planning periods, for achieving reasonable progress goals for Class I areas within and outside Missouri. The progress report for the first planning period contains the most up-to-date status of the control measures for the first planning period as of 2014. This 2025 progress report will provide updates on those control measures. For the second planning period, control measures to reduce emissions within and outside Missouri are found in the 2022 plan, Chapter 4: Additional Factors in Establishing Long Term Strategy, Section 4.1.3 Four-Factor Analysis for Point Sources, Section 4.2.2: Federal

Programs that Reduce Emissions, Section 4.2.3: State Programs that Reduce Emissions, 4.2.5: Source Retirements and Replacement Schedules, and Appendix E, Consent Agreements. First, this section discusses control measures to reduce emissions inside Missouri, categorizing the measures by the first or second planning period. Then, this section discusses control measures to reduce emissions outside of Missouri.

### **3.1.1 Control Measures to Reduce Emissions Within Missouri**

#### ***3.1.1.1 Measures from the First Planning Period that continue to be relied upon in the Second Planning Period***

The 2014 progress report discusses the control measures included in the first planning period in Section A.1. Strategies in the first planning period focused on reducing NO<sub>x</sub> and SO<sub>2</sub> emissions, which are the largest contributors to visibility impairment in Missouri's Class 1 areas. This section contains updated status on all strategies listed in Section A.1. of the 2014 Progress Report.

##### **3.1.1.1.1 CAIR**

In 2006, Missouri promulgated the following state rules in the Missouri Code of State Regulations (CSR) to implement CAIR: 10 CSR 10-6.362 *Clean Air Interstate Rule Annual NO<sub>x</sub> Trading Program*, 10 CSR 10-6.364 *Clean Air Interstate Rule Seasonal NO<sub>x</sub> Trading Program*, and 10 CSR 10-6.366 *Clean Air Interstate Rule SO<sub>x</sub> Trading Program*. In 2015, CAIR was replaced by CSAPR. Accordingly, Missouri removed these three rules from the Missouri Code of State Regulations in 2019. 10 CSR 10-6.362 and 10 CSR 10-6.366 are also removed from Missouri's SIP. 10 CSR 10-6.364 remains in Missouri's SIP. Missouri submitted a request to the EPA in November 2019 to remove this rule from Missouri's SIP, and this request is pending EPA review.

In 2016, Missouri promulgated the following state rules to implement CSAPR: 10 CSR 10-6.372 *Cross-State Air Pollution Rule NO<sub>x</sub> Annual Trading Program* and 10 CSR 10-6.374 *Cross-State Air Pollution Rule NO<sub>x</sub> Ozone Season Group 2 Trading Program*. These rules remain in Missouri's Code of State Regulations and Missouri's SIP. Emission reductions from these rules continue to contribute to Missouri's reasonable progress goals in Missouri's Regional Haze SIP.

##### **3.1.1.1.2 BART**

In the plan for the first planning period, twenty-six potential BART sources were identified that were not subject to CAIR or CSAPR. Twenty-five of these sources were not required to install new controls under BART through either screening or refined analysis. The remaining facility entered into a consent agreement, which was included as part of the plan for the first planning period. In 2012, that facility discontinued all operations and was decommissioned. Therefore, the only remaining BART sources are the EGUs that are subject to CSAPR, which has continued to be relied upon for emission reductions in the second planning period. See section 1.5 of this progress report for additional details regarding the history of BART for EGUs and the CAIR and CSAPR trading programs.

#### 3.1.1.1.3 Tier 2

These are federal emission standards for passenger cars, light trucks, and larger vehicles. The EPA created the Tier 2 standards in 2000, and since then, has made more stringent Tier 3 standards in 2014 and the Multi-Pollutant Emission Standards in 2024. The Tier 3 standards began in 2017. Emission reductions from these standards continue to contribute to Missouri's reasonable progress goals in Missouri's Regional Haze SIP. The Multi-Pollutant Standards will phase in beginning with model year 2027.

#### 3.1.1.1.4 Tier 4

These are federal emission standards for diesel engines used in industrial settings. The EPA created these standards in 2004; through 2014, it amended or created new rules for this source category. Emission reductions from these standards continue to contribute to Missouri's reasonable progress goals in Missouri's Regional Haze SIP.

#### 3.1.1.1.5 NO<sub>x</sub> SIP Call

This program was developed to assist downwind ozone areas in attaining the one-hour and 8-hour ozone NAAQS by providing upwind NO<sub>x</sub> emission control. The air pollution control program developed four state rules in response to the NO<sub>x</sub> SIP Call: 10 CSR 10-6.350, *Emission Limitations and Emissions Trading of Oxides of Nitrogen*, 10 CSR 10-6.360, *Control of NO<sub>x</sub> Emissions from Electric Generating Units and Non-Electric Generating Boilers*, 10 CSR 10-6.380, *Control of NO<sub>x</sub> Emissions from Portland Cement Kilns*, and 10 CSR 10-6.390, *Control of NO<sub>x</sub> Emission from Large Stationary Internal Combustion Engines*. In September 2018, 10 CSR 10-6.350 and 10 CSR 10-6.360 were rescinded from Missouri's Code of State Regulations because the legal proceedings against CSAPR were adjudicated. The air pollution control program submitted a request to EPA on November 14, 2018, to remove these regulations from Missouri's SIP. This request is pending EPA review. CSAPR did not supersede 10 CSR 10-6.380 and 10 CSR 10-6.390, which remain in Missouri's Code of State Regulations and Missouri's SIP. Emission reductions from these standards continue to contribute to Missouri's reasonable progress goals in Missouri's Regional Haze SIP.

#### 3.1.1.1.6 Additional Measures

The modeling demonstration for the first planning period did not include the following measures. However, emission reductions from these standards continue to contribute to Missouri's reasonable progress goals in Missouri's Regional Haze SIP. These measures are the 2010 SO<sub>2</sub> NAAQS Demonstrations, the Illinois Multi-Pollutant Regulations, EPA's Tier 3 standards, and EPA's 2007 Heavy-Duty Highway Rule. Although not mentioned in the progress report for the first planning period, the National Emission Standards for Hazardous Air Pollutants for Coal- and Oil-Fired Electric Utility Steam Generating Units<sup>11</sup> rule, promulgated in 2002, and the

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<sup>11</sup> These standards are codified in 40 CFR part 63, Subpart UUUU. These standards are also known as the Mercury and Air Toxics Standards.



National Emission Standards for Hazardous Air Pollutants for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters<sup>12</sup> rule, promulgated in 2011, and EPA's Acid Rain program contain emission limits that reduce emissions contributing to visibility.

### ***3.1.1.2 Measures from the Second Planning Period***

#### **3.1.1.2.1 Four-Factor Analysis for Point Sources and Consent Agreement**

40 CFR 51.308(f)(2)(i) requires the air program to evaluate four factors in developing the long-term strategy in the 2022 plan. The four factors are the cost of compliance, the time necessary for compliance, the energy and non-air quality environmental impacts of compliance, and the remaining useful life of an emission source. 40 CFR 51.308(f)(2)(iv) requires the air program to consider additional factors in developing the long-term strategy, such as emission reductions due to ongoing air pollution control programs and emission source retirement and replacement schedules.

The air program conducted the four-factor analysis for seven facilities in the 2022 plan. For one facility, the air program determined that no additional measures were available to reduce emissions, and the facility should maintain current operational practices consistent with its operating permit. For six facilities, the air program determined that new enforceable requirements were necessary to make reasonable progress in the Long Term Strategy included in the 2022 plan. The air program established consent agreements with each facility to establish these new permanent and enforceable requirements. The air program also considered other control measures in the 2022 plan, including federal regulations, mobile source emissions, and source retirements.

#### **3.1.1.2.2 Consent Agreements**

In the 2022 plan, the air program determined that the following measures were required to make reasonable progress:

- Preventing any future purchases of coal unless it is western sub-bituminous coal, hereafter referred to as low-sulfur coal because it has inherently lower sulfur content than other types of coal
- Operating existing emission control systems at all times during coal combustion

The air program executed consent agreements with six facilities to establish federally enforceable requirements implementing these measures. These facilities and their FIPS county-plant identification numbers are Ameren Missouri – Labadie Energy Center (071-0003), Ameren Missouri – Rush Island Energy Center (099-0016), New Madrid Power Plant (143-0004), Thomas Hill Energy Center (175-0001), City Utilities of Springfield Missouri – John Twitty Energy Center (077-0039), and Sikeston Power Station (201-0017)<sup>13</sup>.

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<sup>12</sup> These standards are codified in 40 CFR part 63, Subpart DDDDD. These standards are also known as the Boiler MACT.

<sup>13</sup> The consent agreements appear in the 2022 plan, Appendix E.

Ameren Missouri – Labadie Energy Center (071-0003) has four coal-fired boilers (B-1 through B-4). The facility must control sulfur dioxide (SO<sub>2</sub>) emissions by combusting low-sulfur coal. The facility must control nitrogen oxide (NO<sub>x</sub>) emissions using low-NO<sub>x</sub> burners, separated over-fire air, and neural network optimization control systems during coal combustion. Although these requirements reflect current operating conditions, the consent agreement establishes them as permanent and enforceable requirements in the state implementation plan.

Ameren Missouri – Rush Island Energy Center (099-0016) has two coal-fired boilers (B-1 and B-2). The facility must control SO<sub>2</sub> emissions by combusting low-sulfur coal. The facility must control NO<sub>x</sub> emissions using low-NO<sub>x</sub> burners, separated over-fire air, and neural network optimization control systems during coal combustion. Although these requirements reflect current operating conditions, the consent agreement establishes them as permanent and enforceable requirements in the state implementation plan.

New Madrid Power Plant (143-0004) has two coal-fired boilers (EP-01 and EP-02). The facility must control SO<sub>2</sub> emissions by combusting low-sulfur coal. The facility can use a limited amount of higher sulfur coal for reliability purposes to burn out the cyclones and prevent them from clogging the slag trap. The facility must control NO<sub>x</sub> emissions using over-fire air and selective catalytic reduction control systems during coal combustion. The facility is subject to CSAPR. CSAPR compliance options allow for purchasing emission allowances instead of using control systems. In past years, this facility has not continuously and consistently operated its SCR and has used the allowance purchasing option somewhat frequently to comply with CSAPR. The consent agreement requires the operation of the control system at all times when combusting coal and makes this requirement permanent and enforceable in the state implementation plan.

Thomas Hill Energy Center (175-0001) has three coal-fired boilers (EP01, EP02, and EP03). The facility must control SO<sub>2</sub> emissions by combusting low-sulfur coal. The facility must control NO<sub>x</sub> emissions using over-fire air and selective catalytic reduction control systems during coal combustion. The facility must also use the low NO<sub>x</sub> burner control system on boiler EP03 at all times when combusting coal. The facility is subject to CSAPR. The CSAPR compliance options allow purchasing emission allowances instead of using control systems. In past years, this facility has not continuously and consistently operated its SCR and has used the allowance purchasing option somewhat frequently to comply with CSAPR. The consent agreement requires the operation of the control system at all times when combusting coal and makes this requirement permanent and enforceable in the state implementation plan.

City Utilities of Springfield, Missouri – John Twitty Energy Center (077-0039) has two coal-fired boilers (E09 and E100). The facility obtained a construction permit in 2004 containing limits to control NO<sub>x</sub> and SO<sub>2</sub> emissions from E100 by requiring low-sulfur coal, a dry lime injection fluidized bed scrubber, and selective catalytic reduction control systems. The air program executed a consent agreement to implement emission control measures on E09 in the 2022 plan. The facility must control SO<sub>2</sub> emissions of E09 by combusting low-sulfur coal. The facility must control NO<sub>x</sub> emissions of E09 by using a selective catalytic reduction control system at all times during coal combustion. The facility is subject to CSAPR. The CSAPR compliance options allow for purchasing emission allowances instead of using control systems.

Although the facility has consistently operated its selective catalytic reduction control system, the facility could decide not to use it and remain compliant with CSAPR. The consent agreement removes the option not to use a selective catalytic reduction control system. The consent agreement requires the operation of the control system at all times when combusting coal and makes this requirement permanent and enforceable in the state implementation plan.

Sikeston Power Station (201-0017) has one coal-fired boiler (EP-01). The facility must control SO<sub>2</sub> emissions by combusting low-sulfur coal. The facility must control NO<sub>x</sub> emissions using over-fire air and low NO<sub>x</sub> burner control systems during coal combustion. Although these requirements reflect current operating conditions, the consent agreement establishes them as permanent and enforceable requirements in the state implementation plan.

These measures and their implementation are described in detail in the 2022 plan, section 4.1.3 and Appendix E. These permanent and enforceable measures will be fully implemented 180 days after EPA approves the 2022 plan. There has been no change in the implementation status for the requirements included in these consent agreements since the air program submitted the 2022 plan to the EPA.

#### 3.1.1.2.3 State Programs that Reduce Emissions

The 2022 plan's long-term strategy considered state rules that control emissions. Missouri has numerous regulations in the federally approved SIP that help control emissions that contribute to visibility impairment. All of Missouri's SIP-approved rules are identified in 40 CFR 52.1320. Emission reductions from these rules continue to contribute to Missouri's reasonable progress goals in Missouri's Regional Haze SIP.

#### 3.1.1.2.4 Diesel Emissions Reduction Act and Volkswagen Trust Funds

The 2022 plan's long-term strategy also considered other mobile source emission reduction programs. The 2022 plan, section 4.2.3.4.1, includes the Diesel Emissions Reduction Act, and section 4.2.3.4.2 includes the Volkswagen Trust Funds. These programs provide funding opportunities to upgrade mobile sources fleets with newer mobile sources, resulting in decreased emissions of NO<sub>x</sub>, particulate matter, and other pollutants. Emission reductions from these programs continue to contribute to Missouri's reasonable progress goals in Missouri's Regional Haze SIP.

#### 3.1.1.2.5 Source Retirement and Replacement Schedules

The 2022 plan's long-term strategy considered past and planned emission unit retirements. Table 2 shows units with actual or future retirement dates between 2014 and 2028. Most of these units have retired, with planned retirements for Ameren Missouri – Meramec Energy Center, Evergy Inc. – Lake Road,<sup>14</sup> Ameren Missouri – Sioux Energy Center, and Empire Energy Center. These retirement dates can change due to facility planning and energy demand. Ameren Missouri – Meramec Energy Center units were scheduled to retire in December 2022, and the facility has

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<sup>14</sup> Formerly Kansas City Power & Light – Lake Road

not operated and has reported no emissions since that date. The 2022 plan mentions the planned retirement of Ameren Missouri – Rush Island Energy Center, with an anticipated date of March 2024. On September 20, 2023, the United States District Court for the Eastern District of Missouri issued a decision extending the retirement of the Ameren Missouri – Rush Island Energy Center facility to October 2024.<sup>15</sup> The facility is limited by court order to only operate when necessary to maintain grid reliability/stability as dictated by the regional transmission operator. In October 2024, Ameren Missouri – Rush Island Energy Center retired. Emission reductions from these retirements continue to contribute to Missouri’s reasonable progress goals in Missouri’s Regional Haze SIP.

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<sup>15</sup> Case 4:11-cv-00077-RWS

Table 2: Electric Generating Units Retirement Schedule<sup>16</sup>

Facility Name	FIPS County-Plant ID	State Emission Unit ID	ORIS Facility ID	Unit Number	Retirement Date	Source of Retirement Date	Current Status
Empire District Electric – Asbury	097-0001	7	2076	1	March 2020	Letter from facility	Retired
Associated Electric Cooperative, Inc. – Chamois	151-0002	EP-03 and EP-04	2169	1 and 2	2014	CAMD, 2013 EIA 860 Report, Press Releases	Retired
City Utilities of Springfield Missouri – James River Power Plant	077-0005	E06	2161	3	December 2017	2019 EIA 860 Report	Retired
City Utilities of Springfield Missouri – James River Power Plant	077-0005	E07	2161	4	December 2020	Facility official	Retired
City Utilities of Springfield Missouri – James River Power Plant	077-0005	E08	2161	5	December 2020	Facility official	Retired
Ameren Missouri – Meramec Energy Center	189-0010	001	2104	1	December 2022	2023 EIA 860 Report, 2023, Facility 2023 Integrated Resource Plan	Retired
Ameren Missouri – Meramec Energy Center	189-0010	002	2104	2	December 2022	2023 EIA 860 Report, Facility 2023 Integrated Resource Plan	Retired
Ameren Missouri – Meramec Energy Center	189-0010	003	2104	3	December 2022		Retired
Ameren Missouri – Meramec Energy Center	189-0010	004	2104	4	December 2022		Retired

<sup>16</sup> This table appears as Table 41 in the 2022 plan. Table 41 shows Evergy Inc. – Lake Road with a retirement date of December 2024, this date is rescheduled to December 2030. Table 41 does not contain Ameren Missouri – Rush Island Energy Center , which is newly added in this progress report.

<b>Facility Name</b>	<b>FIPS County- Plant ID</b>	<b>State Emission Unit ID</b>	<b>ORIS Facility ID</b>	<b>Unit Number</b>	<b>Retirement Date</b>	<b>Source of Retirement Date</b>	<b>Current Status</b>
Evergy Inc. – Lake Road	021-0004	05	2098	6	December 2030	2023 EIA 860 Report	Operating
Evergy Inc. – Montrose	083-0001	EP-06	2080	1	2016	Exemption application to Acid Rain and CSPAR programs	Retired
Evergy Inc. – Montrose	083-0001	EP-07	2080	2	2019		Retired
Evergy Inc. – Montrose	083-0001	EP-08	2080	3	2019		Retired
Evergy Inc. – Sibley	095-0031	5A	2094	1	2019	Exemption application to Acid Rain and CSPAR programs	Retired
Evergy Inc. – Sibley	095-0031	5B	2094	2	2019		Retired
Evergy Inc. – Sibley	095-0031	5C	2094	3	2019		Retired
Ameren Missouri – Sioux Energy Center	183-0001	B-01	2107	1	December 2028	2023 EIA 860 Report	Operating
Ameren Missouri – Sioux Energy Center	183-0001	B-02	2107	2	December 2028		Operating
Ameren Missouri – Howard Bend Combustion Turbine	189-0023	001	2102	CT1A	2015	2023 EIA 860 Report	Retired
Ameren Missouri – Howard Bend Combustion Turbine	189-0023	002	2102	CT1B	2015		Retired
Columbia Municipal Power Plant	019-0002	EP01	2123	6	2016	2023 EIA 860 Report	Retired
Empire Energy Center	097-0062	EP-04	6223	1	December 2035	2023 EIA 860 Report	Operating
Empire Energy Center	097-0062	EP-05	6223	2	December 2035		Operating
Ameren Missouri – Rush Island Energy Center	099-0016	B-1	6155	1	October 2024	2023 EIA 860 Report, Facility 2023 Integrated Resource Plan	Retired
Ameren Missouri – Rush Island Energy Center	099-0016	B-2	6155	2	October 2024		Retired

## **3.1.2 Control Measures to Reduce Emissions Outside Missouri**

### ***3.1.2.1 Measures from the First Planning Period that continue to be relied upon in the Second Planning Period***

#### **3.1.2.1.1 Stationary Source Emissions**

As mentioned in Section 3.1.1.1, Missouri's plan considered stationary source emission reductions from federal regulations, including CAIR, BART, CSAPR, NO<sub>x</sub> SIP Call, and others. Many other states were also subject to these federal requirements and developed state-specific implementation strategies to reduce emissions during the first planning period. Emission reductions from these programs continue to contribute to Missouri's reasonable progress goals in Missouri's Regional Haze SIP.

#### **3.1.2.1.2 Mobile Source Emissions**

As mentioned in Section 3.1.1.1, Missouri's plan considered emission reductions from federal mobile source regulations, including Tier 2, Tier 3, Tier 4, and the 2007 Heavy-Duty Highway Rule. These regulations apply nationally. Emission reductions from these programs continue to contribute to Missouri's reasonable progress goals in Missouri's Regional Haze SIP.

### ***3.1.2.2 Measures from the Second Planning Period***

#### **3.1.2.2.1 Stationary Source Emissions**

The 2022 plan's long-term strategy considered emission reductions from federal stationary source emission regulations, including the National Emission Standards for Hazardous Air Pollutants for Coal- and Oil-Fired Electric Utility Steam Generating Units rule, the National Emission Standards for Hazardous Air Pollutants for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters rule, the Acid Rain program, and CSAPR. The CSAPR applies to facilities with coal-, gas-, and oil-fired electric generating units in 27 states, including Missouri. The CSAPR regulates annual emissions of NO<sub>x</sub> and SO<sub>2</sub> as well as NO<sub>x</sub> emissions during the ozone season. Missouri participates in the NO<sub>x</sub> Annual, the SO<sub>2</sub> Group 1, and the NO<sub>x</sub> Ozone Season Group 2 trading programs under CSAPR. Through CSAPR, the EPA sets an emissions budget for each state. The EPA allocates allowances to affected sources based on these state emission budgets. Affected sources can buy and sell allowances and bank allowances for future use as long as each source holds enough allowances to account for its emissions by the end of the compliance period. Emission reductions from this program continue to contribute to Missouri's reasonable progress goals in Missouri's Regional Haze SIP.

The 2010 SO<sub>2</sub> National Ambient Air Quality Standard has influenced SO<sub>2</sub> emission reductions nationally. Missouri contains the Jackson County maintenance area, the Jefferson County maintenance area, and the New Madrid nonattainment area. The air program performed extensive dispersion modeling for each of these areas. The modeling evaluated nearby SO<sub>2</sub> emission sources and their potential impacts. EPA approved the Jackson County and Jefferson County redesignation requests in January 2022. The New Madrid nonattainment area plan contains consent agreements with permanent and enforceable standards used in the dispersion modeling analysis. The plan is designed to reduce SO<sub>2</sub> emissions and return air quality to

compliance with the standard. The air program submitted the plan to EPA in May 2023; the plan is currently undergoing EPA review. Emission reductions from implementing this standard continue to contribute to Missouri’s reasonable progress goals in Missouri’s Regional Haze SIP.

#### 3.1.2.2.2 Mobile Source Emissions

The 2022 plan’s long-term strategy considered the Federal Motor Vehicle Control Program, which contributes to emission reductions from mobile sources, including NO<sub>x</sub>, particulate matter, and volatile organic compounds. The program decreased limits on sulfur content for gasoline and diesel fuel, reducing SO<sub>2</sub> emissions from mobile sources. Table 3 shows significant federal mobile source programs that reduce emissions. Emission reductions from these rules continue to contribute to Missouri’s reasonable progress goals in Missouri’s Regional Haze SIP.

*Table 3: Federal Mobile Source Emission Reduction Programs*

<b>Control Measure</b>	<b>Description</b>	<b>Start Date</b>
Summer Gasoline Volatility Standard	Reid vapor pressure (RVP) limit for gasoline sold from May 1 to September 15 each year, applicable in Hardin, Jefferson, and Orange Counties.	Phased in from 1991
Large Non-Road Spark-Ignition Engine Emissions Standards	Emission standards for land-based spark-ignition recreational engines, land-based spark-ignition engines rated over 19 kilowatts, and recreational marine diesel engines.	November 2000 - Phased in from model year 2004 through 2007
Regulations to Reduce On-Road Mobile Source Emissions	Series of emissions limits implemented by EPA for on-road vehicles, including Tier 1, Tier 2, and Tier 3 light-duty and medium-duty passenger vehicle standards, heavy-duty vehicle standards, low sulfur diesel standards, National Low Emission Vehicle standards, and reformulated gasoline.	Phase in through 2010 Tier 3 phase in from 2017 through 2025
Regulations to Reduce Area/Non-Road Mobile Source Emissions	Series of emissions limits implemented by EPA for area and non-road sources, such as diesel and gasoline engine standards for locomotives and leaf-blowers.	Phase in through 2018
International Standards to Reduce Emissions from Marine Diesel Engines and Fuels	Fuel sulfur limits and NO <sub>x</sub> emissions standards for oceangoing vessels operating in the North American Emission Control Area.	January 2015 for fuel standards and January 2016 for engine standards



### *3.2 Emissions reductions achieved throughout the state from implementing the measures in Missouri's Regional Haze SIP*

40 CFR 51.308(g)(2) requires a summary identifying and estimating emission reductions of visibility-impairing pollutants within Missouri from the measures listed in 40 CFR 51.308(g)(1). This includes all measures relied upon by the air program in 40 CFR 51.308(g)(1) to achieve reasonable progress toward the national visibility goal, regardless of whether the measures were in place during the first or second planning period. First, this section discusses measures that overlap in the first and second planning periods. Then, this section discusses measures that are unique to the second planning period.

This periodic update focuses on two of the most significant contributors to visibility impairment: SO<sub>2</sub> and NO<sub>x</sub>. Overall, SO<sub>2</sub> and NO<sub>x</sub> emissions have decreased in Missouri. This section describes the emission reductions achieved by the measures overlapping between the first and second planning periods and measures specific to the 2022 plan: consent agreements, federal programs, state programs, and source retirements. This analysis reinforces the determination that Missouri's Class I areas will meet the reasonable progress goals in the 2022 plan.

#### **3.2.1 Overlapping Measures from the first and second planning periods**

##### ***3.2.1.1 Federal Programs***

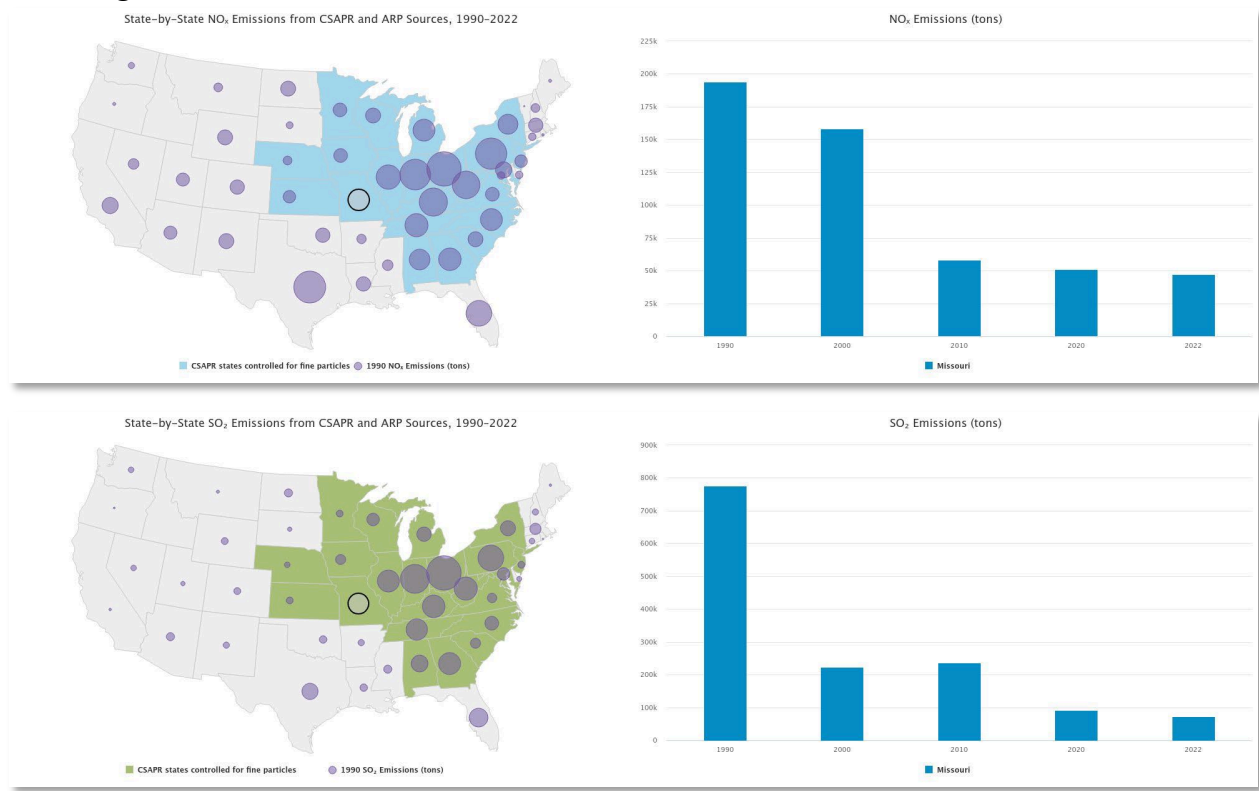
The CSAPR program creates NO<sub>x</sub> and SO<sub>2</sub> emission reductions in 22 states, including Missouri. Throughout these 22 states, SO<sub>2</sub> emissions decreased by about 1.4 million tons, and NO<sub>x</sub> emissions decreased by about 0.6 million tons from 1990 through 2022. Ozone season NO<sub>x</sub> emissions decreased by about 240,000 since 2015.<sup>17</sup> The Missouri NO<sub>x</sub> ozone season emissions budget decreased by 5,269 tons from 2023 to 2028. The overall NO<sub>x</sub> budget reduction for 22 participating states is 92,926 tons between 2023 and 2028. These emission reductions are pivotal to improving visibility in Class I areas nationwide. The Missouri annual NO<sub>x</sub> budget is capped at 45,818 tons, and the SO<sub>2</sub> annual budget is capped at 160,959 tons for 2017 and later years. The electric generating units in Missouri have emitted less than the NO<sub>x</sub> and SO<sub>2</sub> annual budgets since CSAPR began. Figure 5<sup>18</sup> shows NO<sub>x</sub> and SO<sub>2</sub> emissions trends from 1990 to 2022. The figure shows sharp decreases attributed to CSAPR and the Acid Rain Program.

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<sup>17</sup><https://www.epa.gov/power-sector/progress-report-emissions-reductions#so2>  
<https://www.epa.gov/power-sector/progress-report-emissions-reductions#nox>

<sup>18</sup> <https://www.epa.gov/power-sector/progress-report-emissions-reductions#so2>

*Figure 5: Missouri's NO<sub>x</sub> and SO<sub>2</sub> Emissions Trends from 1990 to 2022 for CSAPR and Acid Rain Program Facilities*



The second planning period includes consent agreements for six facilities. All these facilities report to EPA's Clean Air Markets Program: Ameren Missouri – Labadie Energy Center (071-0003), Ameren Missouri – Rush Island Energy Center (099-0016), New Madrid Power Plant (143-0004), Thomas Hill Energy Center (175-0001), City Utilities of Springfield Missouri – John Twitty Energy Center (077-0039), and Sikeston Power Station (201-0017). Table 4 shows emissions trends from 2014 to 2023 for these six facilities from EPA's Clean Air Markets Program. The table shows that most of the six facilities' NO<sub>x</sub> and SO<sub>2</sub> emissions decreased from 2014 to 2023. In particular, Rush Island Energy Center's NO<sub>x</sub> and SO<sub>2</sub> emissions decreased by 87 percent and 88 percent, respectively, from 2014 to 2023. Labadie Energy Center shows variation in emissions trends from 2014 to 2023. The facility's NO<sub>x</sub> and SO<sub>2</sub> emissions increased from 2016 to 2023. Overall, NO<sub>x</sub> and SO<sub>2</sub> emissions from these six facilities decreased 43 percent and 25 percent, respectively, from 2014 to 2023.

*Table 4: 2014-2023 NO<sub>x</sub> and SO<sub>2</sub> Emissions Trends for Six Facilities*

<b>Facility</b>	<b>Pollutant</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>	<b>Percent Change 2014-2023*</b>
John Twitty Energy Center	NO <sub>x</sub>	951	792	844	903	1,287	702	740	1,111	1,258	966	2
	SO <sub>2</sub>	3,021	2,672	3,316	2,629	3,147	1,558	1,968	2,498	3,153	2,509	-17
Labadie Energy Center	NO <sub>x</sub>	6,687	7,082	6,576	7,050	7,138	6,883	7,649	7,935	7,763	7,256	9
	SO <sub>2</sub>	33,092	34,432	31,113	33,114	33,705	34,475	39,392	41,928	44,265	39,246	19
New Madrid Power Plant	NO <sub>x</sub>	20,885	4,198	16,325	12,435	14,833	14,078	18,227	15,989	15,426	10,019	-52
	SO <sub>2</sub>	16,734	12,379	12,467	13,548	14,866	13,252	12,033	10,486	13,762	10,813	-35
Rush Island Energy Center	NO <sub>x</sub>	2,850	2,899	2,664	3,584	3,210	2,188	3,012	3,261	2,046	367	-87
	SO <sub>2</sub>	17,444	18,253	17,379	22,167	18,484	13,201	17,321	19,529	11,739	2,049	-88
Sikeston Power Station	NO <sub>x</sub>	1,121	855	940	980	898	812	922	1,084	867	841	-25
	SO <sub>2</sub>	7,054	4,799	4,837	4,489	4,261	3,668	4,266	4,799	4,792	4,086	-42
Thomas Hill Energy Center	NO <sub>x</sub>	15,717	10,417	12,595	10,358	9,293	8,985	12,908	11,882	10,321	7,829	-50
	SO <sub>2</sub>	16,602	15,727	14,407	16,509	16,197	16,697	13,702	16,193	13,534	11,289	-32
<b>Total</b>	<b>NO<sub>x</sub></b>	<b>48,211</b>	<b>26,244</b>	<b>39,943</b>	<b>35,310</b>	<b>36,659</b>	<b>33,648</b>	<b>43,459</b>	<b>41,264</b>	<b>37,681</b>	<b>27,278</b>	<b>-43</b>
	<b>SO<sub>2</sub></b>	<b>93,947</b>	<b>88,261</b>	<b>83,519</b>	<b>92,456</b>	<b>90,658</b>	<b>82,851</b>	<b>88,681</b>	<b>95,432</b>	<b>91,245</b>	<b>69,992</b>	<b>-25</b>

\*Negative value indicates decrease in emission

### **3.2.1.2 State programs**

Emission reductions from state programs are not quantified because the emission data systems do not differentiate between state and federal programs. Missouri's overall emission reductions are provided in the National Emissions Inventory.

### **3.2.1.3 Source retirements**

Source retirements contributed to emissions reductions. Table 5 quantifies the emission reductions from units shown in Table 2. The NO<sub>x</sub> and SO<sub>2</sub> reported actual emissions are based on the highest emission year since the first regional haze planning period. Table 5 shows that by 2028, emissions reductions from source retirements are expected to total approximately 37,431.22 tons of NO<sub>x</sub> and 157,756.68 tons of SO<sub>2</sub>.

Table 5: Emissions Reductions from Source Retirements by 2028

Facility Name	FIPs County- Plant ID	Unit ID	Emission Reductions (tons)	
			NO <sub>x</sub>	SO <sub>2</sub>
Empire District Electric – Asbury	097-0001	7	4,829.82	10,755.97
Associated Electric Cooperative, Inc. – Chamois	151-0002	EP-03 and EP-04	2,409.00	5,038.04
City Utilities of Springfield, Missouri – James River Power Plant	077-0005	E06	340.08	963.41
City Utilities of Springfield, Missouri – James River Power Plant	077-0005	E07	482.61	1,120.60
City Utilities of Springfield, Missouri – James River Power Plant	077-0005	E08	954.95	2,146.50
Ameren Missouri – Meramec Energy Center	189-0010	001	642.37	3,352.26
Ameren Missouri – Meramec Energy Center	189-0010	002	589.36	3,451.97
Ameren Missouri – Meramec Energy Center	189-0010	003	1,610.20	5,650.80
Ameren Missouri – Meramec Energy Center	189-0010	004	2,487.84	8,371.65
Evergy Inc. – Lake Road	021-0004	05	2,424.19	2,907.99
Evergy Inc. – Montrose	083-0001	EP-06	2,029.94	3,978.91
Evergy Inc. – Montrose	083-0001	EP-07	2,133.21	3,958.11
Evergy Inc. – Montrose	083-0001	EP-08	2,256.54	4,186.89
Evergy Inc. – Sibley	095-0031	5A	669.90	1,794.70
Evergy Inc. – Sibley	095-0031	5B	535.70	1,1532.40
Evergy Inc. – Sibley	095-0031	5C	1,255.70	10,545.00
Ameren Missouri – Sioux Energy Center	183-0001	B-01	3,453.47	22,188.94
Ameren Missouri – Sioux Energy Center	183-0001	B-02	3,877.72	25,942.63
Ameren Missouri – Howard Bend Combustion Turbine	189-0023	001	0.24	0.35
Ameren Missouri – Howard Bend Combustion Turbine	189-0023	002	0.24	0.35
Columbia Municipal Power Plant	019-0002	EP01	96.15	275.52
Empire Energy Center	097-0062	EP-04	84.90	0.50
Empire Energy Center	097-0062	EP-05	72.10	0.30
Ameren Missouri – Rush Island Energy Center	099-0016	B-1	2,087.16	15,489.85
Ameren Missouri – Rush Island Energy Center	099-0016	B-2	2,107.83	14,103.04
<b>Total</b>			<b>37,431.22</b>	<b>157,756.68</b>

### **3.2.2 Measures specific to the second planning period**

#### ***3.2.2.1 Consent Agreements***

The consent agreements become effective 180 days after EPA approves the 2022 plan. The consent agreements establish new requirements that do not currently exist in Missouri's state implementation plan. Since the consent agreements with the six facilities are not yet effective, the facilities are not required to comply with the measures described above in Section 3.1.1.2 according to Missouri's SIP. However, many of the facilities currently operate their control systems as reflected in the consent agreements. For those facilities, the consent agreements aim to lock in the requirements to continue using the control systems and maintain the emission reductions achieved.

The consent agreements with New Madrid Power Plant (143-0004) and Thomas Hill Energy Center (175-0001) require them to run their selective catalytic reduction (SCR) control systems at all times throughout the year when their boilers combust coal. Although the two facilities may run their selective catalytic reduction control systems to comply with CSAPR, compliance options allow for purchasing emission allowances instead of using control systems. These two facilities have SCR control technology already installed, but the facilities have not consistently operated the controls due to the high operating cost of the technology and the lack of a permanent requirement to run it. In Missouri's plan, these facilities voluntarily agreed to enter into an enforceable Consent Agreement requiring them to run the technology continuously year-round, during all hours when burning coal, following EPA approval of Missouri's plan. Since the facilities operate the control technology during some seasons and years due to economic incentives from emission trading programs they are subject to, the air program attempted not to double-count emissions reductions that would have been reduced by these programs anyways.

To estimate emission reductions from the new requirements, the air program evaluated actual emissions from the facilities during the 10-year period from 2012-2021. It then evaluated actual quarterly emission rates from the units where it was apparent the SCR was likely operated a majority of the time during the quarter, which the air program assumed was the highest actual quarterly emission rate for each unit that was less than 0.2 pounds per million British Thermal Units. The air program then calculated emission reductions for each quarter during the ten-year period by evaluating what emission reductions would have been achieved in every quarter if all the quarterly emission rates above this level were adjusted down to meet this level. The air program then totaled the quarterly values to develop the annual reduction estimates for each year and averaged the annual emission reduction estimates over the 10-year period. The air program's conservative estimate of the actual emission reductions the 2022 plan will achieve is over 17,000 tons per year of NO<sub>x</sub>. Table 5 shows 2012-2021 average annual NO<sub>x</sub> emissions, the estimated emissions that will occur following the implementation of the new measures in the 2022 plan, and the corresponding estimated emission reduction for each unit at these two facilities.

*Table 6: New Madrid and Thomas Hill Facilities – Estimated Annual NO<sub>x</sub> Emissions Reductions with Continuous SCR Operation vs. 2012-2021 Actuals*

Facility	Unit	2012-2021 Average Actual NO <sub>x</sub> Emissions (tons/year)	Estimated NO <sub>x</sub> Emissions with Continuous SCR Operation (tons/year)	Estimated NO <sub>x</sub> Emission Reductions (tons/year)
New Madrid Power Plant	EP01	8,259.6	2,089.6	6,170.0
	EP02	7,651.2	2,790.3	4,860.9
Thomas Hill Energy Center	EP01	2,885.4	980.1	1,905.3
	EP02	4,736.4	1,091.6	3,644.9
	EP03	4,429.4	3,957.9	471.5
<b>Total</b>		<b>27,962.0</b>	<b>10,909.5</b>	<b>17,052.5</b>

### 3.3 *Assessment of visibility conditions using the baseline values from the 2022 plan*

40 CFR 51.308(g)(3) applies to states containing Class I areas. Missouri contains two Class I areas; therefore, §51.803(g)(3) applies and requires the state to assess the following visibility conditions and changes, with values for most impaired, least impaired, and clearest days as applicable expressed in terms of 5-year averages of these annual values. The period for calculating current visibility conditions is 2018-2022 data.

For this progress report, the air program used the 5-year average Interagency Monitoring of Protected Visual Environments (IMPROVE) program data<sup>19</sup> to analyze the 20 percent most impaired and 20 percent clearest days. The air program used the data in the Federal Land Manager Environmental Database.<sup>20</sup> The most recent IMPROVE data is two years old at the time of this progress report. This data is the 5-year average for 2018-2022 based on current reporting schedules.<sup>21</sup> The annual IMPROVE data is typically released between October and December of the year after the data collection year. Therefore, the data released in October 2023 reflects the 2022 annual data. This section contains an analysis of the following:

1. Comparison of current visibility conditions and baseline visibility conditions,
2. Comparison of current visibility conditions and the 2022 plan visibility conditions, and
3. Comparison of current visibility conditions and 2028 reasonable progress goals for Missouri's Class I areas

#### 3.3.1 **Comparison of visibility conditions for Class I Areas in Missouri**

##### 3.3.1.1 *Comparison of current visibility conditions and baseline visibility conditions*

Comparing the current and baseline visibility conditions shows the overall impact of the regional haze program. The air program analyzed the data shown in Table 7 and Table 8. Each table compares current IMPROVE visibility conditions and baseline visibility conditions. The

<sup>19</sup> <http://vista.cira.colostate.edu/IMPROVE/Default.htm>

<sup>20</sup> <http://views.cira.colostate.edu/fed/>

<sup>21</sup> *Overview of Elements for the Regional Haze Second Planning Period State Implementation Plan Progress Reports Due in 2025*, <https://www.epa.gov/visibility/second-planning-period-progress-reports>

IMPROVE program provides the baseline visibility condition value. The Regional Haze Rule defines baseline visibility conditions in §51.301 and specifies the period from 2000 through 2004. This value is calculated for each Class I area. The daily visibility values over a calendar year are averaged into a yearly value. Each yearly value for 2000 through 2004 is averaged to create one value. This process is repeated for the most impaired days and the clearest days. Table 7 contains the values for the 20 percent Most Impaired days. Table 8 contains the values for the 20 percent Clearest days.

For Missouri's Class I areas, Table 7 and Table 8 show that current five-year values are less than those at baseline. This means visibility at Missouri's Hercules-Glades Wilderness Area and Mingo National Wildlife Refuge Class I areas has improved since the beginning of the regional haze program for both the 20 percent Most Impaired and the 20 percent Clearest days.

*Table 7: Comparison of Baseline and Current IMPROVE Values for Missouri's Class I Areas, 20 percent Most Impaired Days (in deciviews)*

<b>Missouri's Class I Area</b>	<b>Baseline 2000-2004</b>	<b>Current IMPROVE 2018-2022</b>	<b>Difference</b>
Hercules-Glades Wilderness Area	26.75	17.36	-9.39
Mingo National Wildlife Refuge	28.02	18.95	-9.07

Note:

Difference = Current IMPROVE minus Baseline; therefore, negative differences indicate an improvement in visibility since the baseline.

*Table 8: Comparison of Baseline and Current IMPROVE Values for Missouri's Class I Areas, 20 percent Clearest Days (in deciviews)*

<b>Missouri's Class I Area</b>	<b>Baseline 2000- 2004</b>	<b>Current IMPROVE 2018-2022</b>	<b>Difference</b>
Hercules-Glades Wilderness Area	12.84	8.85	-3.99
Mingo National Wildlife Refuge	14.37	10.25	-4.12

Note:

Difference = Current IMPROVE minus Baseline; therefore, negative differences indicate an improvement in visibility since the baseline.

### ***3.3.1.2 Comparison of current visibility conditions and the 2022 plan visibility conditions***

40 CFR 51.308(g)(3) requires the state to assess the following visibility conditions and changes, with values for most impaired, least impaired, and clearest days, as applicable, expressed in terms of 5-year averages of these annual values. The period for calculating current visibility conditions is 2018-2022 data. This section calculates the difference between "current visibility conditions for the most impaired days," "current visibility conditions for the clearest days," and "baseline visibility conditions," using the baseline values from the 2022 plan.

Comparing the current visibility conditions and the 2022 plan visibility conditions shows the impact of the regional haze program since the air program submitted the 2022 plan. The air program analyzed the data shown in Table 9 and Table 10. Each table compares current

IMPROVE values and values presented in the 2022 plan. The values presented in the 2022 plan span from 2014-2017.

For Missouri's Class I areas, Table 9 and Table 10 show that current five-year values at Hercules-Glades Wilderness Area and Mingo National Wildlife Refuge are less than those presented in the 2022 plan. This means visibility improved since the time of the 2022 plan for both the 20 percent Most Impaired and the 20 percent Clearest days.

*Table 9: Comparison of 2022 plan and Current IMPROVE Values for Missouri's Class I Areas, 20 percent Most Impaired Days (in deciviews)*

<b>Missouri's Class I Area</b>	<b>2022 Plan 2014-2017</b>	<b>Current IMPROVE 2018-2022</b>	<b>Difference</b>
Hercules-Glades Wilderness Area	18.76	17.36	-1.40
Mingo National Wildlife Refuge	20.14	18.95	-1.19

Note:

Difference = Current IMPROVE minus 2022 Plan; therefore, negative differences indicate an improvement in visibility since the time of the 2022 plan.

*Table 10: Comparison of 2022 plan and Current IMPROVE Values for Missouri Class I Areas, 20 percent Clearest Days (in deciviews)*

<b>Class I Area</b>	<b>2022 Plan 2014-2017</b>	<b>Current IMPROVE 2018-2022</b>	<b>Difference</b>
Hercules-Glades Wilderness Area	9.75	8.85	-0.90
Mingo National Wildlife Refuge	11.21	10.25	-0.96

Note:

Difference = Current IMPROVE minus 2022 Plan; therefore, negative differences indicate an improvement in visibility since the time of the 2022 plan.

### ***3.3.1.3 Comparison of current visibility conditions and 2028 reasonable progress goals for Missouri's Class I areas***

Comparing current visibility conditions and 2028 reasonable progress goals for Missouri's Class I areas supports the assessment of the 2022 plan elements and strategy to meet reasonable progress goals in Section 3.6 of this report. Table 11 presents values for the 20 percent Most Impaired days and Table 12 presents values for the 20 percent Clearest days. Table 11 shows that current IMPROVE values for Hercules-Glades Wilderness Area are less than the modeled 2028 reasonable progress goals for the 20 percent Most Impaired days. This means visibility conditions at Hercules-Glades Wilderness Area met the reasonable progress goal ahead of schedule. Table 11 shows that current IMPROVE values for Mingo National Wildlife Refuge are in progress to meeting the modeled 2028 reasonable progress goals for the 20 percent Most Impaired days. Table 12 shows that current IMPROVE values for both Hercules-Glades Wilderness Area and Mingo National Wildlife Refuge are less than the modeled 2028 reasonable progress goals for the 20 percent Clearest days.



*Table 11: Comparison of Current IMPROVE Values and Modeled 2028 Reasonable Progress Goals for Missouri Class I Areas, 20 percent Most Impaired Days (in deciviews)*

<b>Class I Area</b>	<b>Modeled Reasonable Progress Goals 2028</b>	<b>Current IMPROVE 2018-2022</b>	<b>Difference</b>
Hercules-Glades Wilderness Area	17.44	17.36	-0.08
Mingo National Wildlife Refuge	18.88	18.95	0.07

Note:

Difference = Current IMPROVE minus Modeled Reasonable Progress Goals; therefore, negative differences indicate that current IMPROVE conditions are lower (i.e., better) than the 2028 Modeled Reasonable Progress Goals.

*Table 12: Comparison of Current IMPROVE Values and Modeled 2028 Reasonable Progress Goals for Missouri Class I Areas, 20 percent Clearest Days (in deciviews)*

<b>Class I Area</b>	<b>Modeled Reasonable Progress Goals 2028</b>	<b>Current IMPROVE 2018-2022</b>	<b>Difference</b>
Hercules-Glades Wilderness Area	9.18	8.85	-0.33
Mingo National Wildlife Refuge	10.78	10.25	-0.53

Note:

Difference = Current IMPROVE minus Modeled Reasonable Progress Goals; therefore, negative differences indicate that current IMPROVE conditions are lower (i.e., better) than the 2028 Modeled Reasonable Progress Goals.

Figure 6 and Figure 7 illustrate visibility conditions in Hercules-Glades Wilderness Area and Mingo National Wildlife Refuge. The figures show that visibility conditions at both of Missouri's Class I areas are less than the uniform rate of progress glide paths, indicating that Missouri is on the path to reaching natural visibility conditions by 2064.

Figure 6: Visibility Conditions at Hercules-Glades Wilderness Area along with Uniform Rate of Progress Glidepath

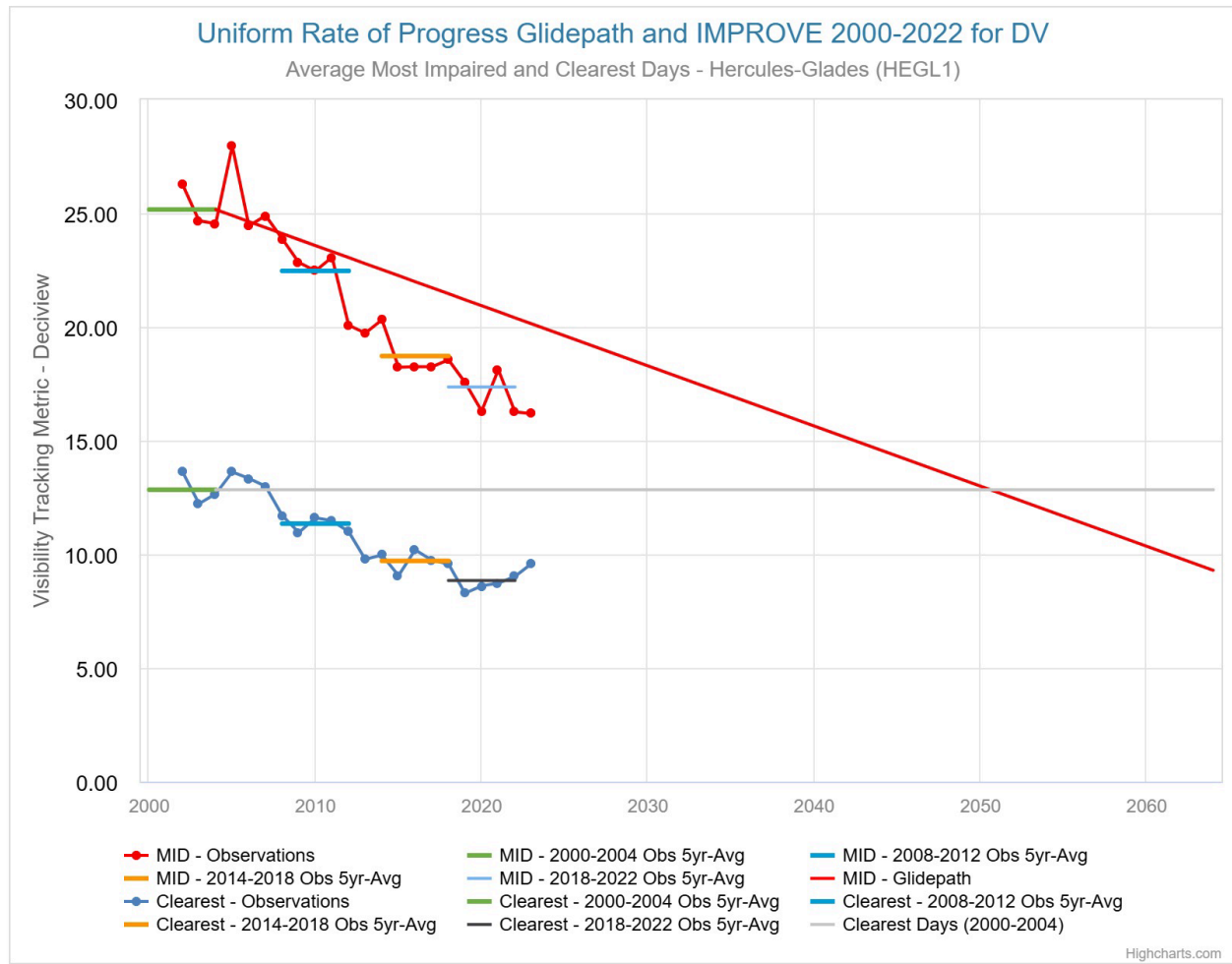
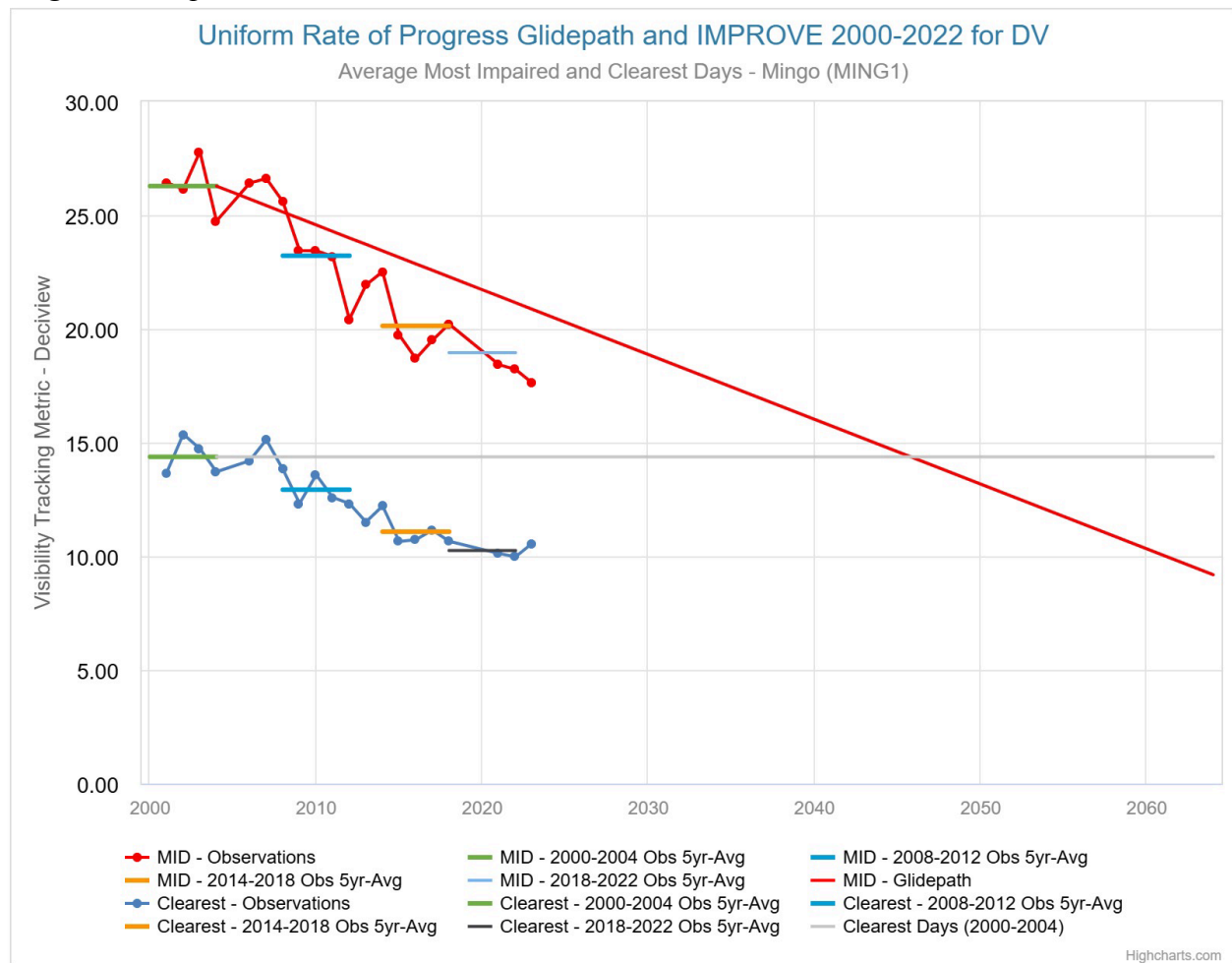


Figure 7: : Visibility Conditions at Mingo National Wildlife Refuge along with Uniform Rate of Progress Glidepath



### 3.3.2 Comparison of visibility conditions for Class I Areas outside Missouri

The air program added this section to comply with 40 CFR 51.308(g)(6), which requires an assessment of whether the 2022 plan elements and strategies are sufficient to enable Missouri or other states with Class I areas affected by emissions from Missouri to meet all established reasonable progress goals. In this progress report, the air program compares visibility conditions for Class I areas outside of Missouri for the same seven Class I areas identified in the 2022 plan, section 4.1.4, that are affected by emissions from Missouri. These seven Class I areas are: Isle Royale Wilderness (Michigan), Seney National Wildlife Refuge (Michigan), Sipsey Wilderness Area (Alabama), Mammoth Cave National Park (Kentucky), Upper Buffalo Wilderness Area (Arkansas), Shining Rock Wilderness Area (North Carolina), and Linville Gorge Wilderness Area (North Carolina).

### ***3.3.2.1 Comparison of current visibility conditions and baseline visibility conditions for Class I Areas Outside Missouri***

Comparing the current and baseline visibility conditions shows the overall impact of the regional haze program. The air program analyzed the data shown in Table 13 and Table 14. Each table compares current IMPROVE visibility conditions and baseline visibility conditions. The IMPROVE program provides the baseline visibility condition value. The Regional Haze Rule defines baseline visibility conditions in §51.301 and specifies the period from 2000 through 2004. This value is calculated for each Class I area. The daily visibility values over a calendar year are averaged into a yearly value. Each yearly value for 2000 through 2004 is averaged to create one value. This process is repeated for the most impaired days and the clearest days. Table 13 contains the values for the 20 percent Most Impaired days. Table 14 contains the values for the 20 percent Clearest days.

For Class I areas outside of Missouri, Table 13 and Table 14 show that current five-year values are less than those at baseline. This means visibility at these Class I areas has improved since the beginning of the regional haze program for both the 20 percent Most Impaired and the 20 percent Clearest days.

*Table 13: Comparison of Baseline and Current IMPROVE Values for Class I Areas Outside Missouri, 20 percent Most Impaired Days (in deciviews)*

<b>Class I Area</b>	<b>State</b>	<b>Baseline 2000-2004</b>	<b>Current 2018-2022</b>	<b>Difference</b>
Isle Royale Wilderness	Michigan	19.63	14.25	-5.38
Seney National Wildlife Refuge	Michigan	23.58	16.18	-7.40
Sipsey Wilderness Area	Alabama	27.59	17.11	-10.48
Mammoth Cave National Park	Kentucky	29.83	19.13	-10.70
Upper Buffalo Wilderness	Arkansas	24.21	16.40	-7.81
Shining Rock Wilderness Area	North Carolina	28.13	14.03	-14.10
Linville Gorge Wilderness Area	North Carolina	28.05	14.74	-13.31

Note:

Difference = Current IMPROVE minus Baseline; therefore, negative differences indicate an improvement in visibility since the baseline.

*Table 14: Comparison of Baseline and Current IMPROVE Values for Class I Areas Outside Missouri, 20 percent Clearest Days (in deciviews)*

<b>Class I Area</b>	<b>State</b>	<b>Baseline 2000-2004</b>	<b>Current 2018-2022</b>	<b>Difference</b>
Isle Royale Wilderness	Michigan	6.77	4.75	-2.02
Seney National Wildlife Refuge	Michigan	7.14	4.87	-2.27
Sipsey Wilderness Area	Alabama	15.57	10.15	-5.42
Mammoth Cave National Park	Kentucky	16.51	10.23	-6.28
Upper Buffalo Wilderness	Arkansas	11.71	7.98	-3.73
Shining Rock Wilderness Area	North Carolina	7.70	3.85	-3.85
Linville Gorge Wilderness Area	North Carolina	11.11	6.56	-4.55

Note:

Difference = Current IMPROVE minus Baseline; therefore, negative differences indicate an improvement in visibility since the baseline.

### ***3.3.2.2 Comparison of visibility conditions for Class I Areas Outside Missouri***

In Missouri's 2022 plan, section 3 explains the visibility trends analysis is based on the 2014-2018 IMPROVE data. Comparing the current visibility conditions, and the visibility conditions from the same time period for the Class I areas outside Missouri shows the impact of the regional haze program. The air program analyzed the data shown in Table 15 and Table 16. Each table compares current IMPROVE values and values presented in 2014-2018.

For Class I areas outside of Missouri, Table 15 and Table 16 show that current five-year values at states outside of Missouri Class I areas decreased since 2014-2018. This means visibility improved since 2014-2018 for both the 20 percent Most Impaired and the 20 percent Clearest days.

*Table 15: Comparison of 2022 plan and Current IMPROVE Values for Class I Areas Outside Missouri, 20 percent Most Impaired Days (in deciviews)*

<b>Class I Area</b>	<b>State</b>	<b>2014-2018</b>	<b>Current 2018- 2022</b>	<b>Difference</b>
Isle Royale Wilderness	Michigan	15.54	14.25	-1.29
Seney National Wildlife Refuge	Michigan	17.57	16.18	-1.39
Sipsey Wilderness Area	Alabama	19.03	17.11	-1.92
Mammoth Cave National Park	Kentucky	21.02	19.13	-1.89
Upper Buffalo Wilderness	Arkansas	17.95	16.40	-1.55
Shining Rock Wilderness Area	North Carolina	15.49	14.03	-1.46
Linville Gorge Wilderness Area	North Carolina	16.42	14.74	-1.68

Note:

Difference = Current IMPROVE minus 2022 Plan; therefore, negative differences indicate an improvement in visibility since the time of the 2022 plan.

*Table 16: Comparison of 2022 plan and Current IMPROVE Values for Class I Areas outside Missouri, 20 percent Clearest Days (in deciviews)*

<b>Class I Area</b>	<b>State</b>	<b>2014-2018</b>	<b>Current 2018-2022</b>	<b>Difference</b>
Isle Royale Wilderness	Michigan	5.30	4.75	-0.55
Seney National Wildlife Refuge	Michigan	5.27	4.87	-0.4
Sipsey Wilderness Area	Alabama	10.76	10.15	-0.61
Mammoth Cave National Park	Kentucky	11.31	10.23	-1.08
Upper Buffalo Wilderness	Arkansas	8.20	7.98	-0.22
Shining Rock Wilderness Area	North Carolina	4.40	3.85	-0.55
Linville Gorge Wilderness Area	North Carolina	7.61	6.56	-1.05

Note:

Difference = Current IMPROVE minus 2022 Plan; therefore, negative differences indicate an improvement in visibility since the time of the 2022 plan.

### ***3.3.2.3 Comparison of current visibility conditions and 2028 reasonable progress goals for Class I areas outside Missouri***

Comparing current visibility conditions and 2028 reasonable progress goals for Class I areas outside of Missouri supports the assessment of the 2022 plan elements and strategy to meet reasonable progress goals in Section 3.6 of this report. Table 17 presents values for the 20 percent Most Impaired days and Table 18 presents values for the 20 percent Clearest days. Table 17 shows that current IMPROVE values for the Class I areas outside of Missouri are less than the modeled 2028 reasonable progress goals for the 20 percent Most Impaired days. This means visibility conditions at the Class I areas outside of Missouri met the reasonable progress goal ahead of schedule. Table 18 shows that current IMPROVE values for states outside of Missouri are less than the modeled 2028 reasonable progress goals for the 20 percent Clearest days.

*Table 17: Comparison of Current IMPROVE Values and Modeled 2028 Reasonable Progress Goals for Class I Areas outside Missouri, 20 percent Most Impaired Days (in deciviews)*

<b>Class I Area</b>	<b>State</b>	<b>Modeled Reasonable Progress Goals 2028</b>	<b>Current 2018-2022</b>	<b>Difference</b>
Isle Royale Wilderness	Michigan	14.87	14.25	-0.62
Seney National Wildlife Refuge	Michigan	16.82	16.18	-0.64
Sipsey Wilderness Area	Alabama	18.00	17.11	-0.89
Mammoth Cave National Park	Kentucky	19.50	19.13	-0.37
Upper Buffalo Wilderness	Arkansas	16.92	16.40	-0.52
Shining Rock Wilderness Area	North Carolina	14.33	14.03	-0.3
Linville Gorge Wilderness Area	North Carolina	15.15	14.74	-0.41

Note:

Difference = Current IMPROVE minus Modeled Reasonable Progress Goals; therefore, negative differences indicate that current IMPROVE conditions are lower (i.e., better) than the 2028 Modeled Reasonable Progress Goals.

Table 18: Comparison of Current IMPROVE Values and Modeled 2028 Reasonable Progress Goals for Class I Areas outside Missouri, 20 percent Clearest Days (in deciviews)

Class I Area	State	Modeled Reasonable Progress Goals 2028	Current 2018-2022	Difference
Isle Royale Wilderness	Michigan	5.42	4.75	-0.67
Seney National Wildlife Refuge	Michigan	5.30	4.87	-0.43
Sipsey Wilderness Area	Alabama	10.23	10.15	-0.08
Mammoth Cave National Park	Kentucky	10.86	10.23	-0.63
Upper Buffalo Wilderness	Arkansas	8.01	7.98	-0.03
Shining Rock Wilderness Area	North Carolina	4.23	3.85	-0.38
Linville Gorge Wilderness Area	North Carolina	7.28	6.56	-0.72

Note:

Difference = Current IMPROVE minus Modeled Reasonable Progress Goals; therefore, negative differences indicate that current IMPROVE conditions are lower (i.e., better) than the 2028 Modeled Reasonable Progress Goals.

### 3.4 Analysis tracking emissions changes since the 2022 plan

40 CFR 51.308(g)(4) requires an analysis tracking the change since the 2022 plan in emissions of pollutants contributing to visibility impairment from all sources and activities within Missouri.

This progress report analyzes the change in emissions of pollutants contributing to visibility impairment from all sources in Missouri. The analysis covers changes from the time of the 2022 plan to the time of the most recent emissions data. The analysis focuses on two sources of emissions data:

1. 2020 National Emission Inventory, and
2. EPA's Clean Air Markets Program Database.<sup>22</sup>

#### 3.4.1 2020 National Emissions Inventory

The air program complies with 40 CFR Part 51, Subpart A, Air Emissions Reporting Requirements to develop and submit periodic emissions inventories to EPA every three years, including 2017, 2020, and 2023. These inventories provide a comprehensive and detailed estimate of statewide air emissions. This progress report uses the 2020 National Emissions Inventory<sup>23</sup> because the 2023 National Emissions Inventory data will not be released until March 2026. In this section, the air program evaluates emissions of visibility-impairing pollutants across Missouri in categories consistent with the 2022 plan, Section 4.1.1.4. The 2022 plan separates point sources into two categories: non-electric generating units and electric generating units. Section 3.4.2. also presents emissions from electric generating units, using data from EPA's Clean Air Markets Program Database.

<sup>22</sup> <https://campd.epa.gov/>

<sup>23</sup> <https://www.epa.gov/air-emissions-inventories/national-emissions-inventory-nei>

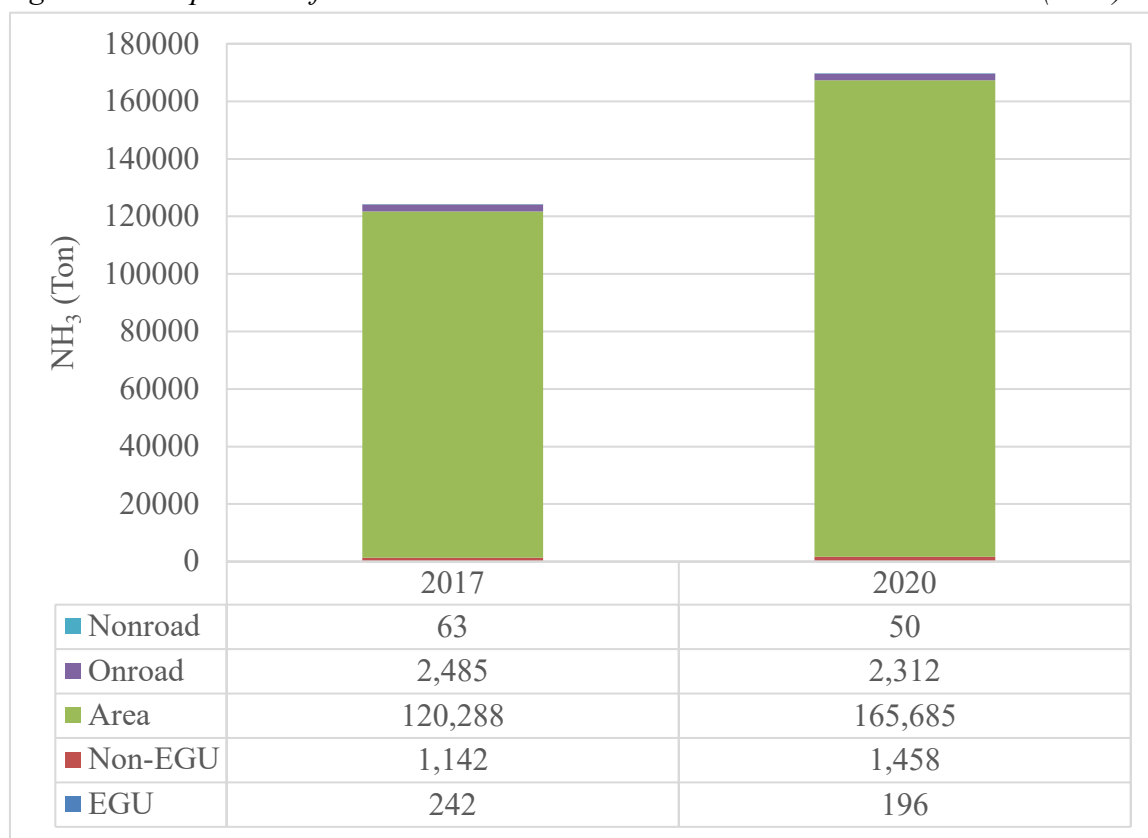
The 2022 plan used the 2017 National Emissions Inventory. Therefore, this section compares data from 2017 and 2020 National Emission Inventories for the following visibility-impairing pollutants for point, nonpoint, nonroad, and onroad emission sources:

- Ammonia (NH<sub>3</sub>)
- Nitrogen Oxides (NO<sub>x</sub>)
- Particulate Matter less than 10 Microns (PM<sub>10</sub>)
- Particulate Matter less than 2.5 Microns (PM<sub>2.5</sub>)
- Sulfur Dioxide (SO<sub>2</sub>)
- Volatile Organic Compounds (VOC)

### 3.4.1.1 Ammonia

Figure 8 shows that the area source category dominates ammonia emissions in Missouri. The figure shows that ammonia emissions increased significantly from 2017 to 2020 due to increases in the area source category. However, this almost solely due to changes in emissions estimation methods for area source categories such as agricultural and animal feeding operations as opposed to changes in actual activity and emissions.

*Figure 8: Comparison of Ammonia Emissions within Missouri in 2017 and 2020 (Tons)*

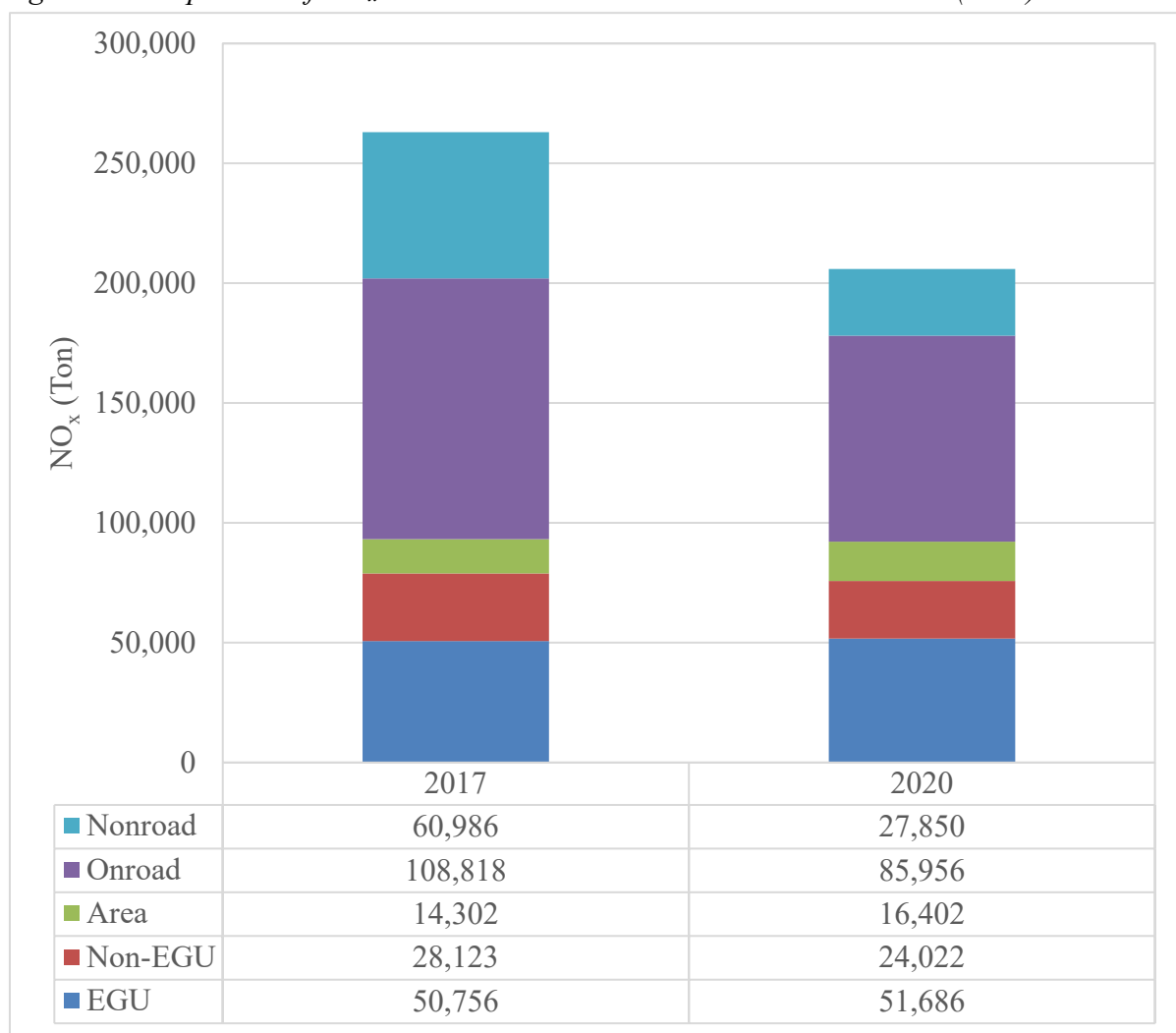




### 3.4.1.2 Nitrogen Oxides

Figure 9 shows 2017 and 2020 anthropogenic NO<sub>x</sub> emissions in Missouri, broken into the following categories: nonroad mobile, onroad mobile, area, non-EGU point, and EGU point. Total NO<sub>x</sub> emissions decreased between the two years by over 20 percent. This was driven largely by steep reductions in the onroad and nonroad mobile source categories. This is due to federal control programs for onroad and nonroad vehicles and engines. Mobile source emissions decrease as older vehicles and equipment with higher emissions are replaced by newer vehicles and equipment with fewer emissions. NO<sub>x</sub> emissions from the other three source categories remained relatively stable between the two years with a modest decrease in the non-EGU sector and slight increases in the area and EGU source sectors. Some of the increase in the area source sector is due to updated methods used to estimate nonpoint emissions.

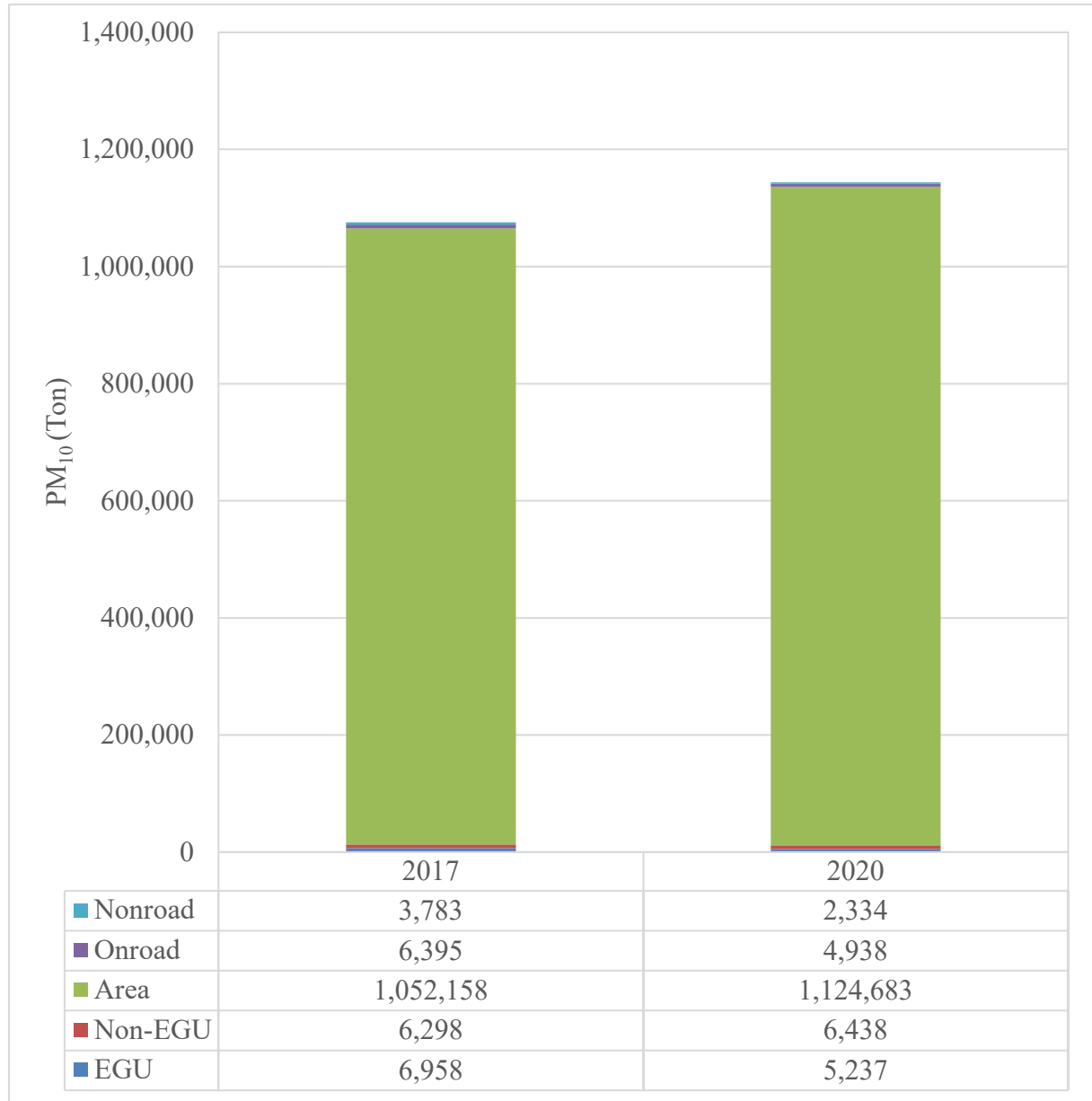
Figure 9: Comparison of NO<sub>x</sub> Emissions within Missouri in 2017 and 2020 (Tons)



### 3.4.1.3 Particulate Matter less than 10 Microns

Figure 10 shows that the area source category largely dominates PM<sub>10</sub> emissions in Missouri. These emissions typically come from residential fuel combustion, especially wood, paved and unpaved road dust, agricultural tilling, and construction dust. The figure shows that total PM<sub>10</sub> emissions increased from 2017 to 2020 due to increases in the area source category. However, this mostly due to changes in emissions estimation methods for area source categories as opposed to changes in actual activity and emissions.

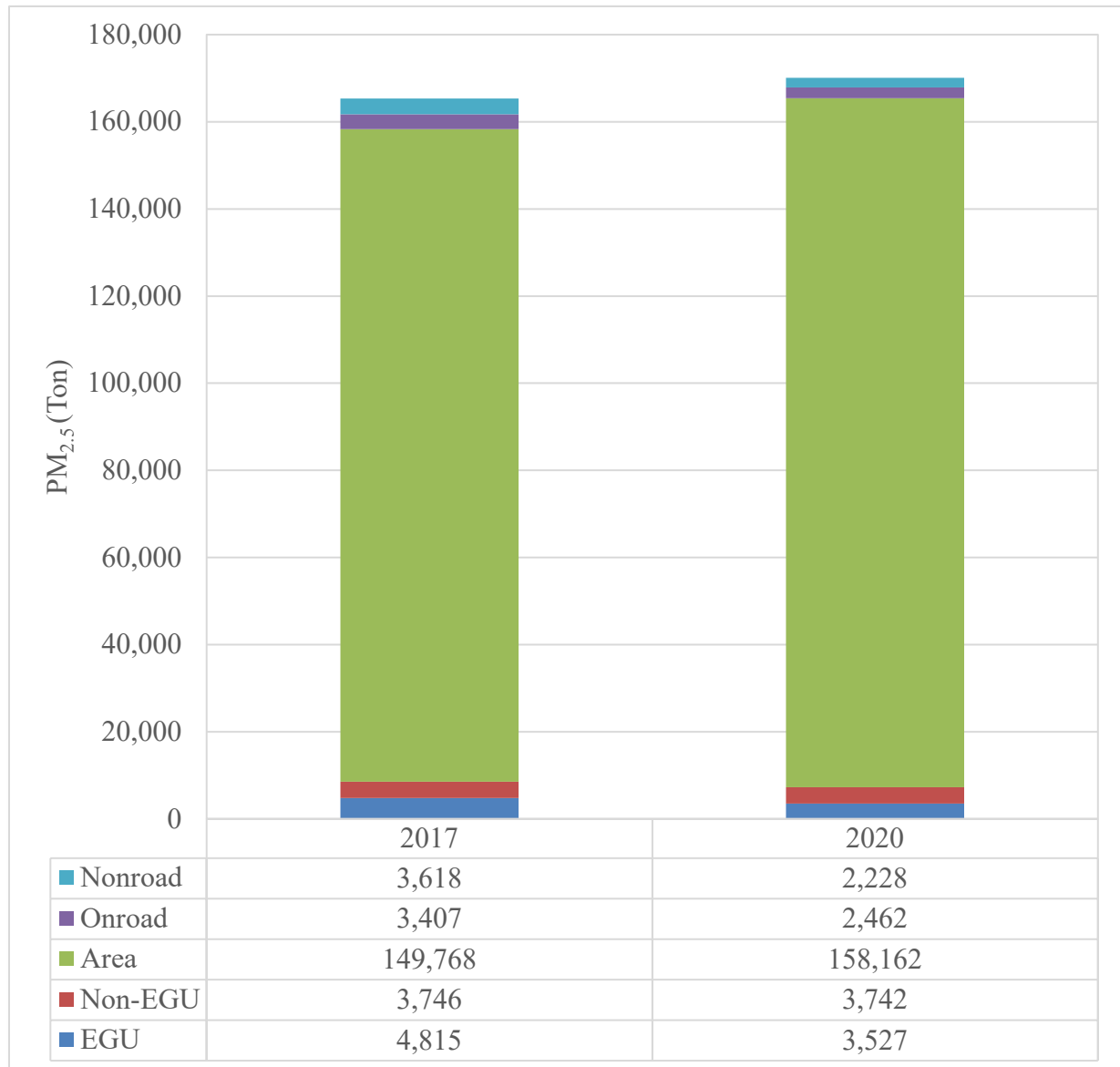
Figure 10: Comparison of PM<sub>10</sub> Emissions within Missouri in 2017 and 2020 (Tons)



#### 3.4.1.4 Particulate Matter less than 2.5 Microns

Figure 11 shows that emissions patterns and trends for PM<sub>2.5</sub> are similar to PM<sub>10</sub>. The area source category also dominates PM<sub>2.5</sub> emissions in Missouri. The figure shows that total PM<sub>2.5</sub> emissions increased from 2017 to 2020 due to increases in the area source category. However, this mostly due to changes in emissions estimation methods for area source categories as opposed to changes in actual activity and emissions. The PM<sub>2.5</sub> emissions from all other source categories decreased between the two years.

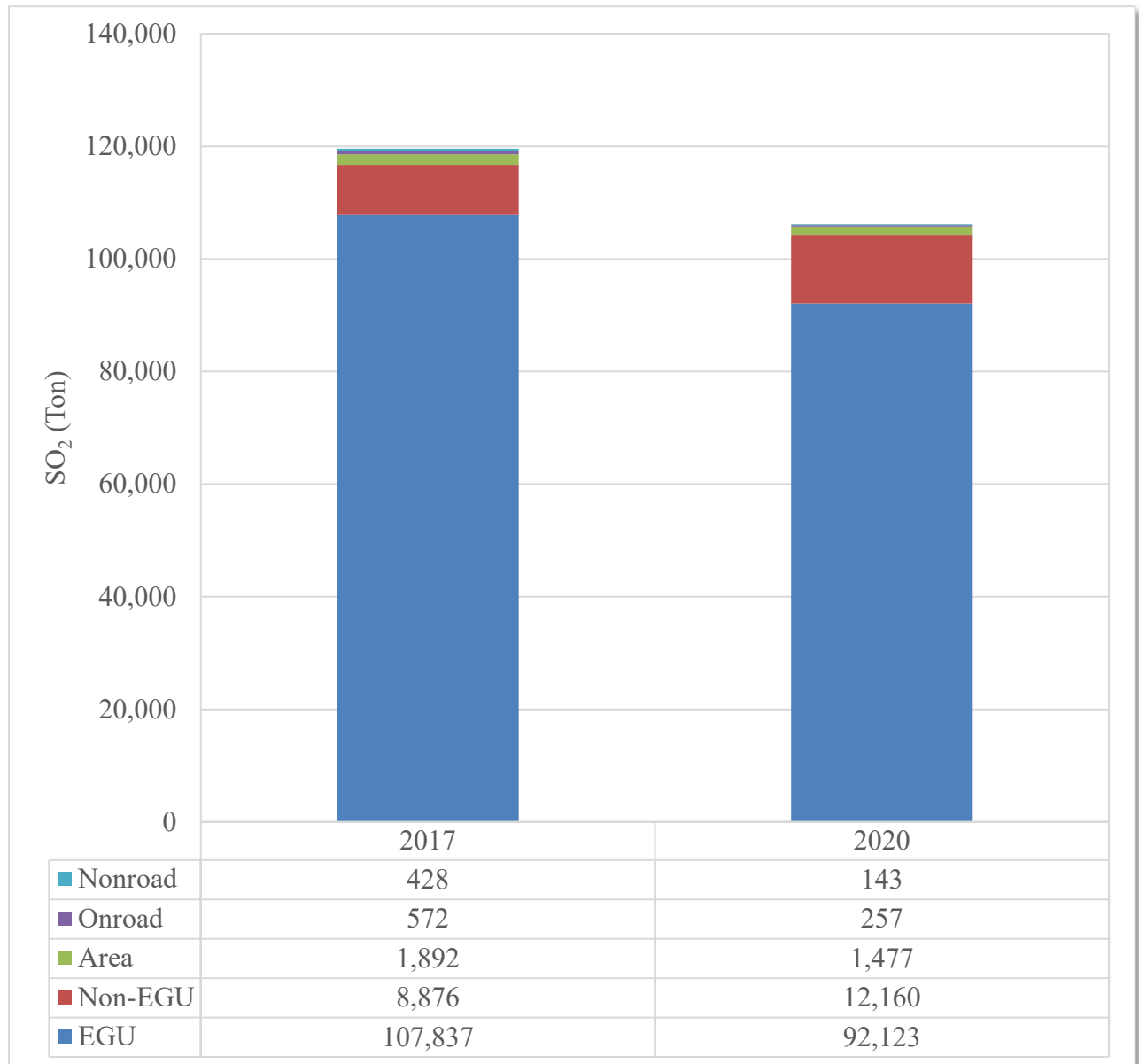
Figure 11: Comparison of PM<sub>2.5</sub> Emissions within Missouri in 2017 and 2020 (Tons)



#### 3.4.1.5 Sulfur Dioxide

Figure 12 shows that the electric generating unit category dominates SO<sub>2</sub> emissions in Missouri. The non-electric generating unit category is second in terms of contribution. Nonroad and onroad sources do not significantly contribute to SO<sub>2</sub> emissions. Total SO<sub>2</sub> emissions between the two years decreased by over 15 percent, driven largely by reductions in the EGU sector. The dramatic decrease in EGU SO<sub>2</sub> emissions is due to power plant retirements and fuel switches resulting from market forces and implementation of several state and federal programs to reduce SO<sub>2</sub> emissions from coal-fired power plants.

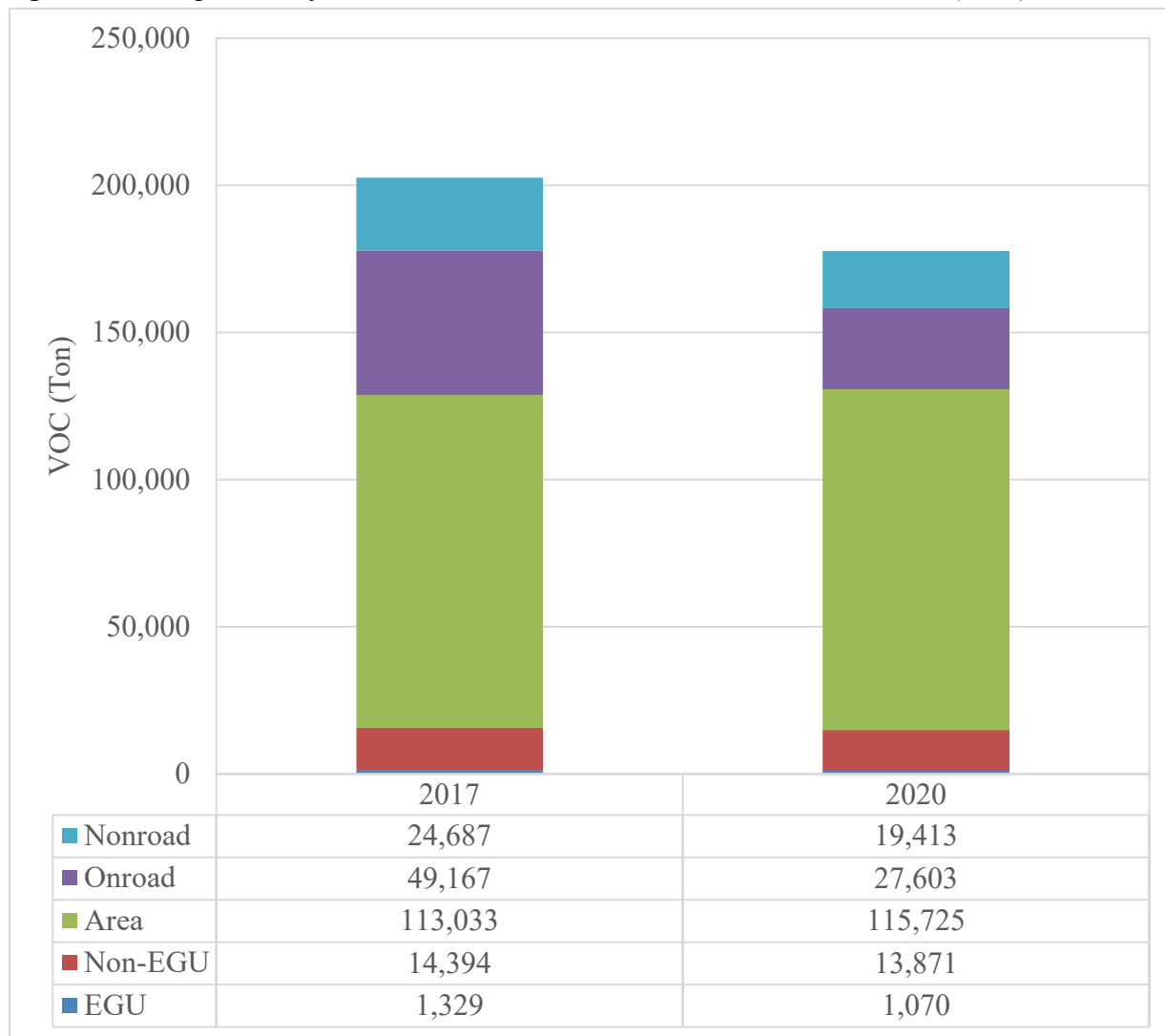
*Figure 12: Comparison of SO<sub>2</sub> Emissions within Missouri in 2017 and 2020 (Tons)*



### 3.4.1.6 Volatile Organic Compounds

Figure 13 shows the area, nonroad, and onroad categories dominate VOC emissions in Missouri followed by non-EGU emissions. The EGU sector does not significantly contribute to total VOC emissions. The data shows that total VOC emissions decreased by over 10 percent driven largely by reductions in the onroad and nonroad mobile source categories. This is due to federal control programs for onroad and nonroad vehicles and engines. Mobile source emissions decrease as older vehicles and equipment with higher emissions are replaced by newer vehicles and equipment with fewer emissions. VOC emissions from the EGU and non-EGU categories decreased slightly between the two years, and there was a slight increase in VOC emissions from the area source category. As with other pollutants, some of the increases in the area source category may be due to changes in emissions estimation methods.

Figure 13: Comparison of VOC Emissions within Missouri in 2017 and 2020 (Tons)



### 3.4.2 EPA's Clean Air Markets Program Database

The air program used EPA's Clean Air Markets Program Database to analyze emissions from electric generating units. The air program compared data from 2017 to 2023. Figure 14 and Figure 15 show NO<sub>x</sub> and SO<sub>2</sub> emissions for 2017, 2020, and 2023 in Missouri for those facilities that report to EPA's database. These facilities include power plants and very large industrial facilities.

Figure 14 and Figure 15 show significant decreases in Missouri's NO<sub>x</sub> and SO<sub>2</sub> emissions between 2017 and 2023. These decreases are due to the current operating practices described in Sections 3.1 and 3.2 above and federal and state measures to achieve and maintain various National Ambient Air Quality Standards. Emission decreases are also due to market forces and fuel switches to natural gas.

*Figure 14: Missouri Facility NO<sub>x</sub> Emissions reported to EPA's Clean Air Markets Program in 2017, 2020, and 2023 (Tons)*

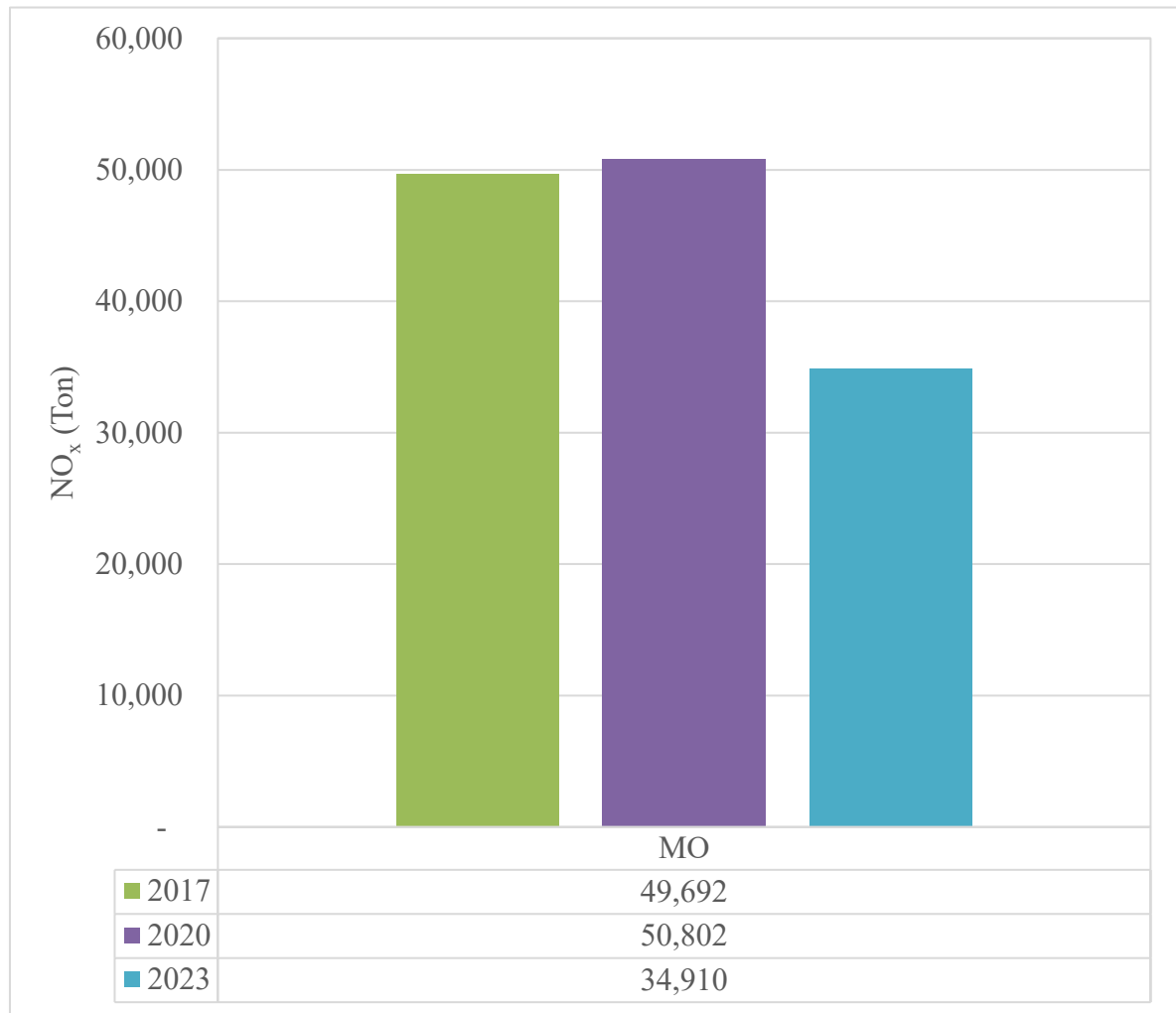


Figure 15: Missouri Facility SO<sub>2</sub> Emissions reported to EPA's Clean Air Markets Program in 2017, 2020, and 2023 (Tons)



### 3.5 Assessment of changes in anthropogenic emissions since the 2022 plan

40 CFR 51.308(g)(5) requires an assessment of any significant changes in manmade emissions within or outside of Missouri since the 2022 plan. The assessment considers whether those changes were anticipated in the 2022 plan and whether they have adversely affected progress toward improving visibility in Missouri's Class 1 areas.

#### 3.5.1 Significant Emission Changes in Missouri

Section 3.4, Figure 8 through Figure 15, show decreased emissions for most visibility-impairing pollutants in Missouri. Although there is some year-to-year variability, there are no unexpected or large enough emissions increases in Missouri to limit or impede visibility improvement. The 2022 plan, Section 4.1.1.4, shows similar NO<sub>x</sub> and SO<sub>2</sub> emissions trends from 2014 to 2017. The 2022 plan anticipated future emissions reduction to occur due to state and federal programs and emission source retirements. The anticipated emissions reduction occurred and are presented in this section. The air program expects future emissions reduction from two electric utilities, as shown in Table 2 and Table 5. Ameren Missouri – Rush Island Energy Center retired in October

2024 by court order, and Ameren Missouri – Sioux Energy Center plans to retire at the end of 2028. Based on this data, there are no significant emissions changes in Missouri that could limit or impede progress in Missouri’s Class 1 areas.

### **3.5.2 Significant Emission Changes Outside Missouri**

The air program evaluated emission changes from other states within the CenSARA region since they are the closest to Missouri and we do not believe that emissions from Missouri affect evaluated Class I areas in subsection 3.3.2 of this document significantly. If emissions from Missouri limited or impeded progress in other state’s Class 1 areas, the impact would be greatest in nearby states. If a significant impact occurs, then it is necessary to evaluate impacts in all states. This section shows emissions from Missouri do not limit or impede progress in other states’ Class 1 areas within the CenSARA region. Therefore, a larger analysis, including all states, is not anticipated to yield different results. This section contains an analysis similar to that of Section 3.4, using the same emission data sources and time periods. However, in this section, the National Inventory emissions data from all point, nonpoint, nonroad, and onroad emission sources are summed for each state. This section evaluates the same visibility-impairing pollutants in Section 3.4:

- Ammonia (NH<sub>3</sub>)
- Nitrogen Oxides (NO<sub>x</sub>)
- Particulate Matter less than 10 Microns (PM<sub>10</sub>)
- Particulate Matter less than 2.5 Microns (PM<sub>2.5</sub>)
- Sulfur Dioxide (SO<sub>2</sub>)
- Volatile Organic Compounds (VOC)

#### **3.5.2.1 Ammonia**

Table 19 shows that ammonia emissions increased between 2017 and 2020 for many of the states within the CenSARA region. The overall emissions increase across the CenSARA region is 31 percent. However, just like for Missouri, these increases are all driven by large increases from the area source category. This is due to changes in area source emissions estimation methods for categories such as agricultural and animal feeding operations as opposed to changes in actual activity or emissions.



*Table 19: Comparison of Ammonia Emissions within the CenSARA region in 2017 and 2020 (Tons)*

<b>State</b>	<b>2017</b>	<b>2020</b>	<b>Difference (2020 – 2017)</b>	<b>Percent Difference</b>
Arkansas	77,465	113,654	36,189	47
Iowa	333,611	353,773	20,162	6
Kansas	155,666	197,044	41,378	27
Louisiana	39,160	72,403	33,243	85
Missouri	123,204	169,590	46,386	38
Nebraska	150,325	197,112	46,787	31
Oklahoma	112,948	179,408	66,460	59
Texas	384,584	522,818	138,234	36
<b>Total</b>	<b>1,376,963</b>	<b>1,805,802</b>	<b>428,839</b>	<b>31</b>

### **3.5.2.2 Nitrogen Oxides**

Table 20 shows that NO<sub>x</sub> emission decreases in every state within the CenSARA region. Overall, NO<sub>x</sub> emissions decreased by 21 percent. Onroad and nonroad mobile source emissions decreased in every state between the two years, which was a primary driver of the overall emission reductions, but EGU emissions also decreased in most states. The mobile source decreases across the CenSARA region are generally attributed to federal emission reduction programs. EGU reductions are driven mainly by power plant retirements and fuel switches as a result of market forces and implementation of various state and federal emission control programs.

*Table 20: Comparison of NO<sub>x</sub> Emissions within the CenSARA region in 2017 and 2020 (Tons)*

<b>State</b>	<b>2017</b>	<b>2020</b>	<b>Difference (2020 – 2017)</b>	<b>Percent Difference</b>
Arkansas	158,248	106,479	-51,769	-33
Iowa	160,826	116,781	-44,045	-27
Kansas	207,174	143,978	-63,196	-31
Louisiana	304,387	263,233	-41,154	-14
Missouri	258,120	205,826	-52,294	-20
Nebraska	137,864	106,504	-31,360	-23
Oklahoma	259,656	200,278	-59,378	-23
Texas	1,013,591	841,301	-172,290	-17
<b>Total</b>	<b>2,499,866</b>	<b>1,984,380</b>	<b>-515,486</b>	<b>-21</b>

### **3.5.2.3 Particulate Matter less than 10 Microns**

Table 21 shows that PM<sub>10</sub> emissions increased for four states. However, total emissions from states within the CenSARA region decreased by 4 percent. Decreases across the CenSARA region are generally attributed to federal emission reduction programs.

Table 21: Comparison of PM<sub>10</sub> Emissions within the CenSARA region in 2017 and 2020 (Tons)

State	2017	2020	Difference (2020 – 2017)	Percent Difference
Arkansas	355,155	374,905	19,750	6
Iowa	352,451	336,706	-15,745	-4
Kansas	601,223	425,259	-175,964	-29
Louisiana	209,800	215,509	5,709	3
Missouri	1,074,450	1,143,578	69,128	6
Nebraska	463,939	367,921	-96,018	-21
Oklahoma	559,405	435,706	-123,699	-22
Texas	1,316,983	1,434,356	117,373	9
<b>Total</b>	<b>4,933,406</b>	<b>4,733,940</b>	<b>-199,466</b>	<b>-4</b>

#### 3.5.2.4 Particulate Matter less than 2.5 Microns

Table 22 shows that PM<sub>2.5</sub> emissions increased for two states. However, total emissions from states within the CenSARA region decreased by 4 percent. Decreases across the CenSARA region are generally attributed to federal emission reduction programs.

Table 22: Comparison of PM<sub>2.5</sub> Emissions within the CenSARA region in 2017 and 2022 (Tons)

State	2017	2020	Difference (2020 – 2017)	Percent Difference
Arkansas	77,032	76,842	-190	0
Iowa	69,110	67,508	-1,602	-2
Kansas	96,552	78,385	-18,167	-19
Louisiana	67,891	67,404	-487	-1
Missouri	164,464	170,045	5,581	3
Nebraska	74,975	64,543	-10,432	-14
Oklahoma	99,240	85,175	-14,065	-14
Texas	261,287	266,675	5,388	2
<b>Total</b>	<b>910,551</b>	<b>876,577</b>	<b>-33,974</b>	<b>-4</b>

#### 3.5.2.5 Sulfur Dioxide

Table 23 shows that SO<sub>2</sub> had the most dramatic decreases, with a 37 percent reduction in emissions from states within the CenSARA region. Decreases across the CenSARA region are generally attributed to reductions from the EGU sector due to power plant retirements and fuel switches driven by market forces and implementation of various state and federal emission control programs.

Table 23: Comparison of SO<sub>2</sub> Emissions within the CenSARA region in 2017 and 2020 (Tons)

State	2017	2020	Difference (2020 – 2017)	Percent Difference
Arkansas	57,217	30,865	-26,352	-46
Iowa	68,559	24,631	-43,928	-64
Kansas	12,234	8,102	-4,132	-34
Louisiana	140,001	93,604	-46,397	-33
Missouri	118,901	105,911	-12,990	-11
Nebraska	56,559	42,614	-13,945	-25
Oklahoma	71,631	28,849	-42,782	-60
Texas	385,910	238,860	-147,050	-38
<b>Total</b>	<b>911,012</b>	<b>573,436</b>	<b>-337,576</b>	<b>-37</b>

### 3.5.2.6 Volatile Organic Compound

Table 24 shows that VOC emissions decreased in all states except one. Because Texas' 2020 VOC emissions are 59 percent of emissions from all states within the CenSARA region, the overall emissions increase across the CenSARA region is 5 percent. Decreases across the CenSARA region are generally attributed to reductions in the onroad and nonroad mobile source categories driven by federal emission control programs for vehicles and equipment.

Table 24: Comparison of VOC Emissions within the CenSARA region in 2017 and 2020 (Tons)

State	2017	2020	Difference (2020 – 2017)	Percent Difference
Arkansas	131,484	110,694	-20,790	-16
Iowa	148,400	136,432	-11,968	-8
Kansas	211,810	161,367	-50,443	-24
Louisiana	238,190	214,756	-23,434	-10
Missouri	200,442	177,620	-22,822	-11
Nebraska	85,993	78,069	-7,924	-9
Oklahoma	325,771	322,635	-3,136	-1
Texas	1,486,884	1,765,055	278,171	19
<b>Total</b>	<b>2,828,974</b>	<b>2,966,628</b>	<b>137,654</b>	<b>5</b>

### 3.5.2.7 EPA's Clean Air Markets Program Database

The air program compared data from 2017 to 2023. Table 25 and Table 26 show NO<sub>x</sub> and SO<sub>2</sub> emissions for 2017 and 2023 for those facilities that report to EPA's system. Table 25 and Table 26 show significant decreases in NO<sub>x</sub> and SO<sub>2</sub> emissions from states within the CenSARA region. NO<sub>x</sub> emissions were reduced by 27 percent, and SO<sub>2</sub> emissions by 52 percent. Decreases across the CenSARA region are generally attributed to power plant retirements and fuel switches driven by market forces and implementation of various state and federal emission control programs.

*Table 25: Comparison of NO<sub>x</sub> Emission sources within the CenSARA region reported to EPA's Clean Air Markets Program in 2017 and 2023 (Tons)*

State	2017	2023	Difference (2023 – 2017)	Percent Difference
Arkansas	27,500	14,664	-12,836	-47
Iowa	22,640	13,322	-9,318	-41
Kansas	13,039	10,409	-2,630	-20
Louisiana	29,249	18,398	-10,851	-37
Missouri	49,692	34,910	-14,782	-30
Nebraska	19,859	18,383	-1,476	-7
Oklahoma	21,768	18,848	-2,920	-13
Texas	109,990	85,309	-24,681	-22
<b>Total</b>	<b>293,737</b>	<b>214,243</b>	<b>-79,494</b>	<b>-27</b>

*Table 26: Comparison of SO<sub>2</sub> Emission sources within the CenSARA region reported to EPA's Clean Air Markets Program in 2017 and 2023 (Tons)*

State	2017	2023	Difference (2023 – 2017)	Percent Difference
Arkansas	47,769	25,935	-21,834	-46
Iowa	30,522	18,327	-12,195	-40
Kansas	5,556	3,262	-2,294	-41
Louisiana	39,701	11,601	-28,100	-71
Missouri	105,993	72,614	-33,379	-31
Nebraska	50,276	41,722	-8,554	-17
Oklahoma	42,081	9,395	-32,686	-78
Texas	276,162	104,347	-171,815	-62
<b>Total</b>	<b>598,060</b>	<b>287,203</b>	<b>-310,857</b>	<b>-52</b>

### 3.6 Assessment of the 2022 plan elements and strategy to meet reasonable progress goals

40 CFR 51.308(g)(6) requires an assessment of whether the 2022 plan elements and strategies are sufficient to enable Missouri or other states with Class I areas affected by emissions from Missouri to meet all established reasonable progress goals in the 2022 plan.

This progress report demonstrates that the elements and strategies in the 2022 plan are sufficient based on the following:

- The 2022 plan elements and strategies are sufficient to enable Missouri and other states with Class 1 areas affected by emissions from Missouri to meet all established reasonable progress goals for the 2022 plan. Section 3.1 explains which measures from the first planning period still contribute to emission reductions and that there is no change in the implementation status of the measures deemed necessary in Missouri's regional haze plan for the second planning period. Section 3.2 details the emission reductions within Missouri from federal and state programs that are relied upon in Missouri's Regional

Haze SIP and details the additional emission reductions to be achieved from new measures in the 2022 plan following EPA approval.

- Section 3.3 shows the ambient visibility monitoring data. Although the new measures in the 2022 plan are not yet implemented, current visibility indexes for Missouri's Class I area show improvements in visibility. These trends indicate that Missouri's Class I areas are on track to meeting the reasonable progress goals established in the 2022 plan. The section also shows that current visibility indexes for Class I areas potentially affected by emissions from Missouri show improvements in visibility. These trends indicate that these outside Class I areas are on track to meeting their reasonable progress goals.
- Section 3.4 presents changes in pollutant emissions from Missouri. Emissions for visibility-impairing pollutants, except PM<sub>10</sub>, PM<sub>2.5</sub>, and ammonia, decreased from the time of the 2022 plan. Most of these increases are due to evolving emission estimation methods. The planned emission source retirements generally occurred as anticipated in the 2022 plan, as detailed in Section 3.1, providing emission reductions within Missouri.
- Section 3.5 demonstrates the emission reductions anticipated in the 2022 plan generally occurred as anticipated. This section also presents changes in pollutant emissions from states within the CenSARA region. In surrounding states, emissions for visibility-impairing pollutants, except ammonia and VOC, decreased from the time of the 2022 plan.
- The data presented in Sections 3.2 through 3.5 indicate no significant emissions changes within or outside Missouri that could limit or impede progress in Class 1 areas in Missouri or other states within the CenSARA region.

### *3.7 Determination of adequacy of the 2022 plan*

40 CFR 51.308(h) requires the air program to analyze the data presented in Sections 3.1 through 3.6 and, based on that data, determine the adequacy of the 2022 plan. Because Missouri contains Class 1 areas, the air program must select one of the four actions detailed in Section 2.

Based on the information and data presented in this progress report, the air program determines that the current strategy in Missouri's Regional Haze SIP, including the first and second planning periods, continues to be adequate and sufficient in achieving the goals laid out by the Federal Regional Haze Rule. Based on the options given and the evidence presented in this report, the air program submits that no further revision of Missouri's 2022 plan is needed at this time.

## **4. Federal Land Manager Consultation**

40 CFR 51.308(i) requires the air program to make the draft progress report available for Federal Land Manager consultation no less than 60 days prior to posting the report for public comment. The consultation must include the opportunity for the Federal Land Managers to discuss their:

1. Assessment of visibility impairment in Class I areas
2. Recommendations on the development and implementation of strategies to address visibility impairment

The air program must include a description of how it addressed any comments the Federal Land Managers provided during the consultation period in the draft report.

The air program provided the draft progress report to the Federal Land Managers on October 17, 2024. Table 27 provides a summary of the consultation activities on this progress report. Additional information on the Federal Land Manager consultation for this progress report is provided in Appendix A – *Federal Land Managers Consultation Documentation*.

*Table 27: Summary of Missouri's Consultation with the Federal Land Managers*

<b>Date</b>	<b>Summary of Activity</b>
10/17/2024	The air program provided the draft progress report to the Federal Land Managers
11/13/2024	The following Federal Land Managers provided written input on the progress report to the air program: Forest Service
12/16/2024	The air program provides written responses to Federal Land Managers' input on the progress report and outlines the timing for the public comment period.
12/30/2024	Missouri publishes notice inviting public comment on the progress report.

## **5. Public Comment**

40 CFR 51.308(g) requires the air program to place the draft progress report on public notice for 30 days, consistent with the air program's public comment process, before submission to EPA. The air program notified the public and other interested parties of the public comment period as follows:

- The air program posted notice of availability of the proposed regional haze progress report on the department's website on December 30, 2024.
- The air program opened a 30-day public comment period after posting the proposed regional haze progress report on the department's website on December 30, 2024. The public comment period will close on January 29, 2025.
- Appendix B – *Public Comments and Response to Public Comments Documentation* will contain all the public comments the air program receives on the progress report along with the air program's summary of all comments and responses.

## **Conclusion**

This progress report addresses Missouri's requirements under 40 CFR 51.308(g), (h), and (i) for the Regional Haze Rule. This progress report evaluates the status of control measures relied upon in Missouri's Regional Haze SIP, estimates emissions reductions and trends, quantifies visibility progress, identifies any impediments to preventing reasonable progress, and assesses the strategy in the 2022 plan. This progress report satisfies all applicable requirements in 40 CFR 51.308, including Federal Land Manager Consultation and public comments. This progress report demonstrates that Missouri's 2022 plan achieves established goals for visibility improvement and emissions reductions, and a revision of the existing plan is not needed.

# **Missouri State Implementation Plan Progress Report**

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## **2025 Progress Report for The Second Regional Haze Planning Period**

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### **Appendix A**

#### **Federal Land Managers Consultation Documentation**

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**Public Review  
December 30, 2024 – January 29, 2025**

**Missouri Department of Natural Resources  
Division of Environmental Quality  
Air Pollution Control Program  
Jefferson City, Missouri**

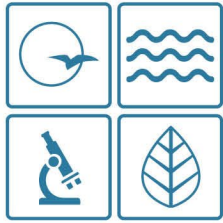


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- 1. Consultation Letters with Federal Land Management Agencies**
- 2. Comment Letters from Federal Land Management Agencies**
- 3. Missouri Response to Comments from Federal Land Management Agencies**

- 1. Consultation Letters with Federal Land Management Agencies**



**MISSOURI**  
DEPARTMENT OF  
NATURAL RESOURCES

**Michael L. Parson**  
Governor

**Dru Buntin**  
Director

October 17, 2024

Tim Allen  
U.S. Fish and Wildlife Service  
Branch of Air Quality  
7333 W. Jefferson Ave., Suite 375  
Lakewood, CO 80235

Sent Via Electronic Mail

Re: Regional Haze Rule Periodic Report Consultation with Federal Land Management Agencies

Dear Tim Allen,

The purpose of this correspondence is to begin consultation with the Federal Land Management agencies on the Regional Haze Rule requirement for periodic reports. Enclosed with this letter is Missouri's draft Progress Report for The Second Regional Haze Planning Period. Missouri has two Class I areas: Hercules-Glades Wilderness Area and Mingo National Wildlife Refuge. All states must submit progress reports on January 31, 2025, July 31, 2033, and every ten years after that. This progress report is for the second planning period. It provides updates on the implementation of measures in Missouri's Regional Haze Plan for the Second Planning Period. The air program submitted the plan to EPA on August 26, 2022.

The Missouri Department of Natural Resources prepared the enclosed report to meet the requirements of 40 CFR 51.308(g), which addresses the need for periodic reports that evaluate progress towards reasonable progress goals established in the State Implementation Plan. The rule also requires states to consult with the Federal Land Management agencies at least 60 days prior to a public comment opportunity (40 CFR 51.308(i)).

State periodic reports for the second implementation period are due to the U.S. Environmental Protection Agency on January 31, 2025 (40 CFR 51.308(g)). In order to facilitate this process and continue our collective efforts to develop a complete progress report for submittal by the deadline, the department has tentatively scheduled the public notice opportunity to begin on **December 31, 2024**.

The department requests the Federal Land Management agencies acknowledge the date of this letter as the formal commencement of the required 60-day consultation period. We would appreciate your comments on or before **December 16, 2024**. We're happy to schedule a virtual meeting or conference call to discuss any aspects of the progress report during the consultation period. Please let me know if you would like a meeting.

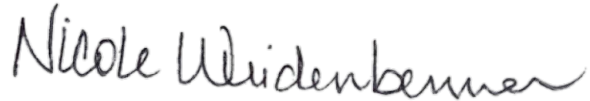


Tim Allen  
Page Two

Should you have any further questions concerning Missouri's progress report, please do not hesitate to contact me at P.O. Box 176, Jefferson City, MO 65102, or by email at [nicole.weidenbenner@dnr.mo.gov](mailto:nicole.weidenbenner@dnr.mo.gov), or by telephone at (573) 751-4817.

Sincerely,

AIR POLLUTION CONTROL PROGRAM

A handwritten signature in black ink that reads "Nicole Weidenbenner". The signature is written in a cursive, flowing style.

Nicole Weidenbenner, Chief  
State Implementation Plan Unit

NW:aa

Enclosure: Copy of Missouri's 2025 Progress Report for The Second Regional Haze  
Planning Period

c: Project # 2018-RH-7 2025 RH Progress Report

October 17, 2024

Melanie Peters  
National Parks Service, Air Resources Division  
PO Box 25287  
Denver, Colorado 80225-0287

Sent Via Electronic Mail

Re: Regional Haze Rule Periodic Report Consultation with Federal Land Management Agencies

Dear Melanie Peters,

The purpose of this correspondence is to begin consultation with the Federal Land Management agencies on the Regional Haze Rule requirement for periodic reports. Enclosed with this letter is Missouri's draft Progress Report for The Second Regional Haze Planning Period. Missouri has two Class I areas: Hercules-Glades Wilderness Area and Mingo National Wildlife Refuge. All states must submit progress reports on January 31, 2025, July 31, 2033, and every ten years after that. This progress report is for the second planning period. It provides updates on the implementation of measures in Missouri's Regional Haze Plan for the Second Planning Period. The air program submitted the plan to EPA on August 26, 2022.

The Missouri Department of Natural Resources prepared the enclosed report to meet the requirements of 40 CFR 51.308(g), which addresses the need for periodic reports that evaluate progress towards reasonable progress goals established in the State Implementation Plan. The rule also requires states to consult with the Federal Land Management agencies at least 60 days prior to a public comment opportunity (40 CFR 51.308(i)).

State periodic reports for the second implementation period are due to the U.S. Environmental Protection Agency on January 31, 2025 (40 CFR 51.308(g)). In order to facilitate this process and continue our collective efforts to develop a complete progress report for submittal by the deadline, the department has tentatively scheduled the public notice opportunity to begin on **December 31, 2024**.

The department requests the Federal Land Management agencies acknowledge the date of this submission as the formal commencement of the required 60-day consultation period. We would appreciate your comments on or before **December 16, 2024**. We're happy to schedule a virtual meeting or conference call to discuss any aspects of the progress report during the consultation period. Please let me know if you would like a meeting.

Melanie Peters

Page Two

Should you have any further questions concerning Missouri's progress report, please do not hesitate to contact me at P.O. Box 176, Jefferson City, MO 65102, or by email at [nicole.weidenbenner@dnr.mo.gov](mailto:nicole.weidenbenner@dnr.mo.gov), or by telephone at (573) 751-4817.

Sincerely,

AIR POLLUTION CONTROL PROGRAM

A handwritten signature in cursive script that reads "Nicole Weidenbenner".

Nicole Weidenbenner, Chief  
State Implementation Plan Unit

NW:aa

Enclosure: Copy of Missouri's 2025 Progress Report for The Second Regional Haze  
Planning Period

c: Project # 2018-RH-7 2025 RH Progress Report

October 17, 2024

Alexia Prosperi  
U.S. Forest Service, Eastern Region  
626 East Wisconsin Ave  
Milwaukee, WI 53202

Sent Via Electronic Mail

Re: Regional Haze Rule Periodic Report Consultation with Federal Land Management Agencies

Dear Alexia Prosperi,

The purpose of this correspondence is to begin consultation with the Federal Land Management agencies on the Regional Haze Rule requirement for periodic reports. Enclosed with this letter is Missouri's draft Progress Report for The Second Regional Haze Planning Period. Missouri has two Class I areas: Hercules-Glades Wilderness Area and Mingo National Wildlife Refuge. All states must submit progress reports on January 31, 2025, July 31, 2033, and every ten years after that. This progress report is for the second planning period. It provides updates on the implementation of measures in Missouri's Regional Haze Plan for the Second Planning Period. The air program submitted the plan to EPA on August 26, 2022.

The Missouri Department of Natural Resources prepared the enclosed report to meet the requirements of 40 CFR 51.308(g), which addresses the need for periodic reports that evaluate progress towards reasonable progress goals established in the State Implementation Plan. The rule also requires states to consult with the Federal Land Management agencies at least 60 days prior to a public comment opportunity (40 CFR 51.308(i)).

State periodic reports for the second implementation period are due to the U.S. Environmental Protection Agency on January 31, 2025 (40 CFR 51.308(g)). In order to facilitate this process and continue our collective efforts to develop a complete progress report for submittal by the deadline, the department has tentatively scheduled the public notice opportunity to begin on **December 31, 2024**.

The department requests the Federal Land Management agencies acknowledge the date of this letter as the formal commencement of the required 60-day consultation period. We would appreciate your comments on or before **December 16, 2024**. We're happy to schedule a virtual meeting or conference call to discuss any aspects of the progress report during the consultation period. Please let me know if you would like a meeting.



Alexia Prosperi  
Page Two

Should you have any further questions concerning Missouri's progress report, please do not hesitate to contact me at P.O. Box 176, Jefferson City, MO 65102, or by email at [nicole.weidenbenner@dnr.mo.gov](mailto:nicole.weidenbenner@dnr.mo.gov), or by telephone at (573) 751-4817.

Sincerely,

AIR POLLUTION CONTROL PROGRAM

A handwritten signature in dark ink that reads "Nicole Weidenbenner". The signature is written in a cursive, flowing style.

Nicole Weidenbenner, Chief  
State Implementation Plan Unit

NW:aa

Enclosure: Copy of Missouri's 2025 Progress Report for The Second Regional Haze  
Planning Period

c: Project # 2018-RH-7 2025 RH Progress Report

## **2. Comment Letters from Federal Land Management Agencies**



United States  
Department of  
Agriculture

Forest  
Service

Mark Twain National Forest  
Supervisor's Office

401 Fairgrounds Road  
Rolla, MO 65401  
573-364-4621  
Fax: 573 364-6844

**File Code:** 2580

**Date:** November 12, 2024

Ms. Nicole Weidenbenner  
Missouri Department of Natural Resources  
Air Pollution Control Program  
State Implementation Plan Unit  
P.O. Box 176  
Jefferson City, Missouri 65102

Dear Ms. Weidenbenner:

On October 17, 2024, the State of Missouri submitted a draft Regional Haze Progress Report for the Second Planning Period for Federal Land Manager (FLM) review describing your evaluation on progress made on the Second Round Regional Haze State Implementation Plan.

This letter acknowledges that the U.S. Department of Agriculture, Forest Service, has conducted a review of your proposed Regional Haze Progress Report. This review satisfies your requirements under the Federal regulations found in 40 CFR § 51.308(i)(2). Please note, however, that only the U.S. Environmental Protection Agency (EPA) can make a final determination about the document's completeness; therefore, only the EPA has the authority to approve the document.

I have been designated as the FLM for the Hercules Glades Wilderness Area, which is a Class I Area under the Clean Air Act. The role of the FLM is covered in 40 CFR Section 51.308(i). We have included comments based on our review and look forward to seeing our comments summarized in the public notice as required by 42 U.S.C §7491 (d).

We appreciate the opportunity to work with the State of Missouri. For questions or more information, please contact Alexia Prosperi at [alexia.prosperi@usda.gov](mailto:alexia.prosperi@usda.gov).

Sincerely,

VINCI KEELER  
Forest Supervisor

Enclosure

cc:  
Alexia Prosperi



## **Technical Comments**

The Forest Service continues to acknowledge the emissions reductions of nitrogen oxides (NO<sub>x</sub>) and sulfur dioxide (SO<sub>2</sub>) that have occurred in Missouri since the first round of Regional Haze. These reductions will continue to lead to improved visibility in our Class I areas.

While emissions reductions have occurred, we are concerned with the quantity of visibility-impairing pollutants still being produced by facilities in Missouri and their impact on reasonable progress. Based on 2020 National Emissions Inventory (NEI) Facility data, Missouri is in the Top 5 states for emissions of both SO<sub>2</sub> and NO<sub>x</sub>. These emissions seem to already be having a negative impact on visibility improvement. More specifically, based off Figure 6 of the Progress Report, visibility on the Clearest Days at Hercules Glades Wilderness Area has been worsening since 2019. This is a concerning trend, and one that will not change without emissions reductions.

Overall, our comments on the draft Regional Haze Progress Report remain consistent with comments we provided during our review of the second round Regional Haze State Implementation Plan (RH SIP) and comments made to EPA on the second round RH SIP approval/disapproval for Missouri. Our comments that specifically relate to the Progress Report are below.

### ***Consent Agreements***

The Forest Service supports efforts put towards the development of consent agreements that will require the use of low sulfur fuel and operating existing emission control systems at all times during coal combustion. However, for at least two of these sources, these agreements do not seem to contribute to reductions in visibility-impairing pollutants. Within the Progress Report, it is stated that both Ameren Missouri – Labadie Energy Center and Ameren Missouri – Rush Island Energy Center will have these consent agreements, but also states that,

“Although these requirements reflect current operating conditions, the consent agreement establishes them as permanent and enforceable requirements in the state implementation plan.”

In this case, while the enforceability of low sulfur fuel and operating existing controls at all times is important, they effectively do nothing to improve visibility. Furthermore, these two facilities are two of the largest emitters of SO<sub>2</sub> in the country. Based off the 2020 NEI, Labadie is the 2<sup>nd</sup> largest emitter of SO<sub>2</sub> in the country, while Rush Island is 7<sup>th</sup>. Labadie is also the 16<sup>th</sup> largest emitter of NO<sub>x</sub>. Given this, we believe for emissions reductions to occur and reasonable progress to be made, upgraded/new control measures would need to be added to these facilities and used year-round, or more stringent enforceable emissions limits would need to be added to permits.

If Rush Island has shut down as suggested in the Progress Report, this comment would not apply to that facility. As for Labadie, we are particularly concerned, as Table 4 shows that emissions of both NO<sub>x</sub> and SO<sub>2</sub> have increased compared to 2014 values.

For New Madrid Power Plant and Thomas Hill Energy Center, the consent agreement likely will result in decreases in NO<sub>x</sub>, as, according to Missouri, these facilities have not continuously and consistently ran their SCR. Based off the 2020 NEI, New Madrid is the largest emitter of NO<sub>x</sub> in the country, and Thomas Hill is the 2<sup>nd</sup> largest, therefore these will be welcome requirements.

However, for both of these units, and for Sikeston Power Station, the only “control” associated with SO<sub>2</sub> is using low-sulfur fuel. Thomas Hill is the 9<sup>th</sup> largest emitter of SO<sub>2</sub> in the country based off the 2020 NEI. New Madrid is the 14<sup>th</sup> largest emitter of SO<sub>2</sub>, and Sikeston is 72<sup>nd</sup>. The lack of controls on these facilities will continue to result in visibility-reducing emissions being produced at a high rate. As shared in our Comment Letter for the second round RH SIP, we believe there are cost-effective controls that can be added to these facilities, and we believe at least some of them are necessary for reasonable progress.

### ***Visibility Impacts***

In the Guidance from August 20, 2019, the EPA states,

“...because regional haze results from a multitude of sources over a broad geographic area, a measure may be necessary for reasonable progress even if that measure in isolation does not result in perceptible visibility improvement.”

Additionally, in the Clarification Memo from July 8, 2021, the EPA states,

“However, a state should generally not reject cost-effective and otherwise reasonable controls merely because there have been emission reductions since the first planning period owing to other ongoing air pollution control programs or merely because visibility is otherwise projected to improve at Class I areas.”

However, in the Progress Report, Missouri attempts to use the argument that visibility is improving, therefore the reasonable progress goals will be met, and so the 2022 plan is sufficient. We do not believe this is a valid argument given the EPA statements above. Widespread emissions controls, particularly for SO<sub>2</sub> and NO<sub>x</sub>, are essential for making reasonable progress at Class I areas both near to, and more distant from, emissions sources. Further, small visibility improvements, even those that may be imperceptible by themselves, are essential for making progress towards the national goal of restoring natural conditions at Class I areas by 2064.

Again, we recommend Missouri re-evaluate whether reasonable progress is being made and consider the implementation of emission limits and/or upgraded/new control measures.

### ***Rush Island***

Within the Progress Report, it is shared that the retirement of Ameren Missouri – Rush Island Energy Center was pushed back from March 2024 to October 2024. It seems that this closure has indeed taken place. If so, we recommend Missouri add this language to the Progress Report.

**From:** [Allen, Tim](#)  
**To:** [Weidenbenner, Nicole](#)  
**Cc:** [Ming, Jaron E](#); [Leath, Mark](#); [Alsharafi, Adel](#); ["wolkins.jed@epa.gov"](#); ["Keas, Ashley"](#); ["Johnson, Keith"](#); ["Avey.Lance@epa.gov"](#)  
**Subject:** Re: [EXTERNAL] Missouri Regional Haze Periodic Report for Federal Land Manager Consultation  
**Date:** Tuesday, December 3, 2024 2:20:37 PM

---

Hi Nicole,

Thank you for the draft Missouri Five-Year Progress Report for the second round of the Regional Haze rule. The US Fish & Wildlife Service is not planning to provide written comments on this document(s).

Tim Allen  
USFWS, Branch of Air and Water Resources

---

**From:** Weidenbenner, Nicole <nicole.weidenbenner@dnr.mo.gov>  
**Sent:** Thursday, October 17, 2024 7:03 AM  
**To:** Allen, Tim <tim\_allen@fws.gov>  
**Cc:** Ming, Jaron E <jaron\_ming@fws.gov>; Leath, Mark <mark.leath@dnr.mo.gov>; Alsharafi, Adel <adel.alsharafi@dnr.mo.gov>; 'wolkins.jed@epa.gov' <wolkins.jed@epa.gov>; 'Keas, Ashley' <keas.ashley@epa.gov>; 'Johnson, Keith' <johnson.keith@epa.gov>; 'Avey.Lance@epa.gov' <Avey.Lance@epa.gov>  
**Subject:** [EXTERNAL] Missouri Regional Haze Periodic Report for Federal Land Manager Consultation

**This email has been received from outside of DOI - Use caution before clicking on links, opening attachments, or responding.**

Mr. Allen,

Please find enclosed a cover letter and a draft report regarding the Missouri Department of Natural Resources Regional Haze Periodic Report. If you have any questions, please let me know.

Thank you,  
Nicole

Nicole Weidenbenner, PE  
State Implementation Plan Unit Chief  
Air Pollution Control Program

Missouri Department of Natural Resources  
(573) 751-4817

**From:** [Peters, Melanie](#)  
**To:** [Weidenbenner, Nicole](#)  
**Cc:** [Salazer, Holly](#); [Shepherd, Don](#); [Stacy, Andrea](#); [Miller, Debra C](#); [Pohlman, David C.](#); [Leath, Mark](#); [Alsharafi, Adel](#); ["wolkins.jed@epa.gov"](#); ["Keas, Ashley"](#); ["Johnson, Keith"](#); ["Avey.Lance@epa.gov"](#)  
**Subject:** Re: [EXTERNAL] Missouri Regional Haze Periodic Report for Federal Land Manager Consultation  
**Date:** Thursday, October 17, 2024 5:50:27 PM

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Hello Nicole,

The NPS appreciates this opportunity to participate in FLM consultation on the Missouri Department of Natural Resources Regional Haze Periodic Report for the Second Planning Period. However, due to competing workload priorities the NPS does not plan to provide consultation feedback on this progress report. Thank you for understanding. We look forward to continued work with Missouri for clean air and clear views in the future.

Best,

Melanie

--

Melanie V. Peters  
NPS, Air Resources Division

Office: 303-969-2315  
Cell: 720-644-7632



---

**From:** Weidenbenner, Nicole <nicole.weidenbenner@dnr.mo.gov>  
**Sent:** Thursday, October 17, 2024 7:08 AM  
**To:** Peters, Melanie <Melanie\_Peters@nps.gov>  
**Cc:** Salazer, Holly <Holly\_Salazer@nps.gov>; Shepherd, Don <Don\_Shepherd@nps.gov>; Stacy, Andrea <Andrea\_Stacy@nps.gov>; Miller, Debra C <Debra\_Miller@nps.gov>; Pohlman, David C. <David\_Pohlman@nps.gov>; Leath, Mark <mark.leath@dnr.mo.gov>; Alsharafi, Adel <adel.alsharafi@dnr.mo.gov>; 'wolkins.jed@epa.gov' <wolkins.jed@epa.gov>; 'Keas, Ashley' <keas.ashley@epa.gov>; 'Johnson, Keith' <johnson.keith@epa.gov>; 'Avey.Lance@epa.gov' <Avey.Lance@epa.gov>  
**Subject:** [EXTERNAL] Missouri Regional Haze Periodic Report for Federal Land Manager Consultation

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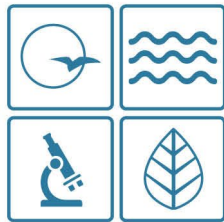
Ms. Peters,

Please find enclosed a cover letter and a draft report regarding the Missouri Department of Natural Resources Regional Haze Periodic Report. If you have any questions, please let me know.

Thank you,  
Nicole

Nicole Weidenbenner, PE  
State Implementation Plan Unit Chief  
Air Pollution Control Program  
Missouri Department of Natural Resources  
(573) 751-4817

### **3. Missouri Response to Comments from Federal Land Management Agencies**



**MISSOURI**  
DEPARTMENT OF  
NATURAL RESOURCES

**Michael L. Parson**  
Governor

**Dru Buntin**  
Director

December 16, 2024

Vinci Keeler, Forest Supervisor  
U.S. Forest Service  
401 Fairgrounds Road  
Rolla, MO 65401

Sent Via Electronic Mail

Re: Response to Comments on Draft Regional Haze Progress Report for the Second Planning Period

Dear Vinci Keeler,

The Missouri Department of Natural Resources' Air Pollution Control Program (air program) received the U.S Department of Agriculture, Forest Service comments (the comment letter) on Missouri's Draft Regional Haze Progress Report for the Second Planning Period (progress report). The air program appreciates the Forest Service's review and comments on the draft progress report. This letter provides the air program's response to the comments.

**Summary of Comments**

The comment letter acknowledges Missouri's emissions reductions of nitrogen oxides (NO<sub>x</sub>) and sulfur dioxide (SO<sub>2</sub>) since the Regional Haze First Planning Period. The comment letter contains concerns on the quantity of visibility-impairing pollutants produced by facilities in Missouri and their impact on reasonable progress. The comment letter cites progress report Figure 6, Visibility Conditions at Hercules-Glades Wilderness Area along with Uniform Rate of Progress Glidepath, which shows that visibility on the Clearest Days at Hercules Glades Wilderness Area has been worsening since 2019. The comment letter also cites Table 4, 2014-2023 NO<sub>x</sub> and SO<sub>2</sub> Emissions Trends for Six Facilities, and the impacts of this data on visibility conditions.

The progress report contains a multi-faceted analysis of visibility-impairing pollutants at Hercules Glades Wilderness Area. It contains evaluations of the status of control measures relied upon in Missouri's regional haze plan for the second planning period, estimation of emissions reductions and trends, quantification of visibility progress, identification of impediments to progress, and assessment of the strategy detailed in the plan.

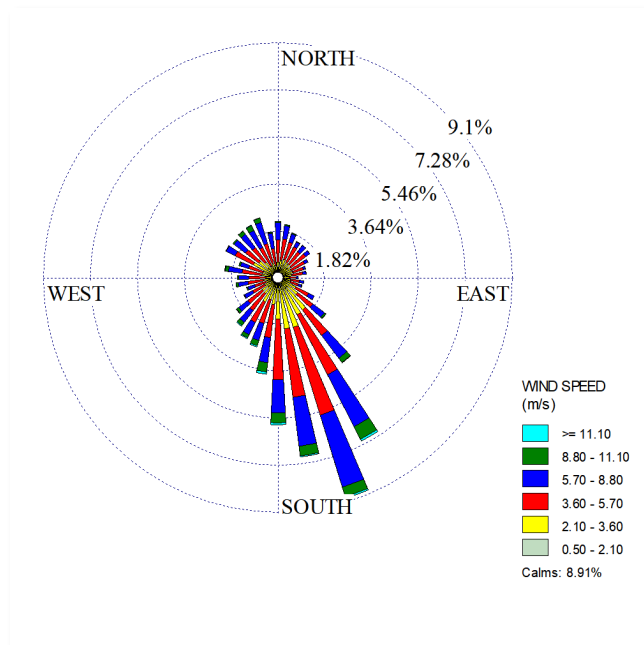
**Clearest Days at Hercules Glades Wilderness Area**

The air program points out that, even though Figure 6 of the progress report shows that visibility on the clearest days at Hercules Glades Wilderness Area has been worsening since 2019, it also



shows that visibility on the most impaired days has been improving since 2018. In addition, visibility condition improvement is gauged by averaging five years of monitoring data not by individual years. Even though Figure 6 includes visibility conditions for each year and 5-year averages, the focus should be on the 5-year average data. The figure shows that the 5-year average (2018-2022) visibility condition is improving compared to the 5-year average (2014-2018) visibility condition. Moreover, due to the location of Hercules Glades Wilderness Area, it is impacted mostly by sources outside of Missouri. This is evident by the following 2021-2023 wind rose plot from Springfield-Branson National Airport, which shows that it is impacted by predominantly winds coming from southeast and south.

The emissions trends from 2017 to 2020 provided in Table 20 and Table 23 of the progress report, indicate that NO<sub>x</sub> and SO<sub>2</sub> emissions decreased sharply in all of CenSARA region. These emissions reductions resulted in visibility conditions improvements in all Class I areas analyzed in the progress report. Table 15, Comparison of 2022 plan and Current IMPROVE Values for Class I Areas Outside Missouri, 20 percent Most Impaired Days, and Table 16, Comparison of 2022 plan and Current IMPROVE Values for Class I Areas outside Missouri, 20 percent Clearest Days, show that visibility conditions improved from 2014-2018 average 5-year to 2018-2022 average 5-year.



The Regional Haze Progress Report is designed to address the requirements found in 40 CFR 51.308(g), (h), and (i). As Missouri's report shows, both of Missouri's Class I areas, and all Class I areas that Missouri may be impacting outside the state are continuing to make reasonable progress and are on track to remain below the established uniform rate of progress and reasonable progress goals identified in Missouri and other state Regional Haze SIPs.

### **Comments on the Regional Haze Plan and Facilities Contributing to Visibility Impairment**

The comment letter states that the Forest Service's comments on the draft Regional Haze Progress Report remain consistent with the Forest Service's comments provided for the second round Regional Haze State Implementation Plan. These comments are summarized below.

The comment letter expresses the importance of requirements in the consent agreements to require facilities to use low sulfur fuel and always operate existing emission control systems during coal combustion. However, the comment letter indicates this will not be enough to improve visibility for some of the facilities. The comment letter indicates that the Ameren Labadie and Ameren Rush Island, which both emit large quantities of SO<sub>2</sub> and NO<sub>x</sub>, should be required to install upgraded/new controls, or more stringent enforceable emissions limits. The comment letter states that Ameren Labadie's SO<sub>2</sub> emission increase from 2014 to 2023 as provided in Table 4 of the progress report.

Ameren Labadie's SO<sub>2</sub> emissions range between 31,113 tons per year and 44,265 tons per year from 2014 to 2023. These emissions ranges are all in compliance with facility's enforceable limits and operating permit conditions. These emissions fluctuations are due to changes in generation due to demand, down-time for maintenance, and other factors.

Regarding the Ameren Rush Island Plant, the comment letter recommends that if Ameren Rush Island is retired, the retirement should be stated in the progress report. The plant has retired as of October 2024, and the air program will update the progress report to reflect this.

The comment letter also indicates that the consent agreements for New Madrid Power Plant and Thoms Hill Energy Center will result in decrease in NO<sub>x</sub> emissions, which will help in visibility improvement. However, the comment letter indicates that SO<sub>2</sub> emissions from these two facilities in addition to Sikeston Power Station should be controlled through new add-on SO<sub>2</sub> control technology at facilities, and the emission reductions are necessary for reasonable progress.

The comment letter states that the progress report attempts to use the argument that visibility is improving, therefore the reasonable progress goals will be met, and so the 2022 plan is sufficient. The comment letter indicates this does not conform to EPA's guidance.

The purpose of the progress report is to address Missouri's requirements under 40 CFR 51.308(g), (h), and (i) for the Regional Haze Rule. The progress report satisfies these requirements by evaluating the status of control measures relied upon in Missouri's regional haze plan for the second planning period, estimating emissions reductions and trends, quantifying visibility progress, identifying impediments to progress, and assessing the strategy detailed in the plan. This evaluation demonstrates that Missouri's regional haze plan for the second planning period is on pace to achieve all established goals for visibility improvement and emissions reductions.

In Missouri's Regional Haze for the second planning period, the air program detailed the control strategies relied upon to meet the established reasonable progress goals for both Class I area in Missouri. The air program responded to all comments received during the Federal Land Managers (FLM) consultation period and the formal public comment period on Missouri's Regional Haze Plan for the Second Planning Period.<sup>1</sup> Appendix G to that plan includes all the FLM consultation documents and Appendix H includes a summary of all comments and the air program's responses for all comments received on the plan. On July 3, 2024, EPA proposed to partially approve and partially disapprove Missouri's Regional Haze Plan for the Second Planning Period.<sup>2</sup> However, EPA's final action on Missouri's plan remains pending. During the public comment period, the air program submitted formal comments on EPA's proposed partial approval/disapproval.<sup>3</sup> The responses the air program provided on Missouri's plan and the comments the air program submitted on EPA's proposed action remain relevant to Missouri's Regional Haze Plan for the Second Planning Period but are outside the scope of the contents of Missouri's Regional Haze Progress Report.

Two items of central relevance are the recent shutdown of the Ameren Rush Island plant, which occurred in October 2024, and the magnitude of the NO<sub>x</sub> emission reductions to be achieved at the Thomas Hill and New Madrid Power Plants following EPA approval of Missouri's Second Round Regional Plan. The air program projects the new NO<sub>x</sub> reductions to be achieved through Missouri's plan will be over 17,000 tons/year from the Thomas Hill and New Madrid Power Plants. The shutdown of the Rush Island plant is also a significant reduction in both SO<sub>2</sub> and NO<sub>x</sub> emissions and is enforceable through court order. However, the Consent Agreements for New Madrid and Thomas Hill in Missouri's Plan include a trigger such that they will only go into effect following EPA approval of Missouri's Plan. As such, the air program encourages the Forest Service to support the approval of Missouri's Plan to secure these substantial reductions in visibility impairing emissions.

### **Public Comment Period on Missouri Regional Haze Progress Report**

The air program intends to update the draft progress report in response to and to document the FLM consultation process for the progress report. Once the report is updated with this information, the air program intends to make the progress report available for public review and comment. The tentative date to post the progress report for public review and comment is December 30, 2024.

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<sup>1</sup> <https://dnr.mo.gov/document-search/state-implementation-plan-revision-missouri-regional-haze-plan-second-planning-period>

<sup>2</sup> 89 FR 55140, July 3, 2024.

<sup>3</sup> <https://dnr.mo.gov/document-search/modnr-comments-epas-proposed-air-plan-partial-approval-partial-disapproval-missouri-regional-haze>

## **Conclusion**

The air program appreciates the inputs from the Forest Service during the FLM consultation period for Missouri's Regional Haze Progress Report. The air program looks forward to continuing working with you on this effort. If you have any questions, you may contact Nicole Weidenbenner, the air program's State Implementation Plan Unit Chief, at P.O. Box 176, Jefferson City, MO 65102, by email at [nicole.weidenbenner@dnr.mo.gov](mailto:nicole.weidenbenner@dnr.mo.gov) or by telephone at (573) 751-4817.

Sincerely,

AIR POLLUTION CONTROL PROGRAM

A handwritten signature in cursive script that reads "Mark Leath".

Mark Leath, Chief  
Air Quality Planning Section

ML:aa

c: Project # 2018-RH-7 2025 RH Progress Report

# **Missouri State Implementation Plan Progress Report**

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## **2025 Progress Report for The Second Regional Haze Planning Period**

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### **Appendix B**

#### **Public Comments and Response to Public Comments Documentation**

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**Public Review  
December 30, 2024 – January 29, 2025**

**Missouri Department of Natural Resources  
Division of Environmental Quality  
Air Pollution Control Program  
Jefferson City, Missouri**



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## **1. Public Notice**

**From:** [Missouri DNR](#)  
**To:** [Leath, Mark](#)  
**Subject:** Accepting Public Comments - Missouri's Progress Report for the Second Regional Haze Planning Period  
**Date:** Monday, December 30, 2024 10:42:34 AM

Missouri Department of Natural Resources. Celebrating 50 Years of Environmental Stewardship



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Missouri's Progress Report for the Second Regional Haze Planning Period is available for public review and comment. The progress report addresses Missouri's requirements under 40 CFR 51.308(g), (h), and (i) for the federal Regional Haze Rule. The U.S. Environmental Protection Agency (EPA) Regional Haze Rule, codified at 40 CFR part 51, Subpart P, Visibility Protection, is designed to reduce visibility impairment from anthropogenic air pollution in 156 mandatory Class I Federal areas (Class I areas). Missouri has two Class I areas: Hercules-Glades Wilderness Area and Mingo National Wildlife Refuge. All states must submit progress reports between planning periods to provide updates on the implementation of measures in the states Regional Haze Plan for the applicable planning period. The department submitted Missouri's Regional Haze Plan for the Second Planning Period to EPA on August 26, 2022. This progress report evaluates the status of control measures relied upon in Missouri's plan, provides emissions reductions and trends, quantifies visibility progress, identifies any impediments to progress, and assesses the strategy detailed in the plan. This evaluation demonstrates that Missouri's regional haze plan for the second planning period achieves established goals for visibility improvement and emissions reductions.

The proposed progress report is available online at <https://dnr.mo.gov/air/what-were-doing/public-notice>. The department invites the public to review and offer written comments on the proposed progress report until January 29, 2025. Written comments may be submitted by mail to Missouri Department of Natural Resources, Air Pollution Control Program, ATTN: Air Quality Section Chief, P.O. Box 176, Jefferson City, MO 65102-0176 or by email to [apcpsip@dnr.mo.gov](mailto:apcpsip@dnr.mo.gov). Comments submitted by email are limit to 3 MB in size. Comments larger than 3 MB need to be submitted by mail to the address above or call 573-751-4817 to make other arrangements.

We'd like your feedback on the service you received from the Missouri Department of Natural Resources. Please consider taking a few minutes to complete the department's Customer Satisfaction Survey at [surveymonkey.com/r/MoDNRsurvey](https://surveymonkey.com/r/MoDNRsurvey).  
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This email was sent to mark.leath@dnr.mo.gov using GovDelivery Communications Cloud on behalf of: Missouri Department of Natural Resources · PO Box 176 · Jefferson City, MO 65102 · 1-800-361-4827





**MISSOURI**  
DEPARTMENT OF  
NATURAL RESOURCES

(/)

**RECEIVED**

*By Planning Section at 9:18 am, Dec 30, 2024*

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English



**DROUGHT ALERT - Conditions improved, with 38% of the state experiencing at least abnormally dry conditions. (/water/alerts-hazards/drought)**

## Calendar

DECEMBER

**30**

Monday

Dec. 30 - Jan. 29 — Statewide

### **Second Regional Haze Planning Period 2025 Progress Report Public Comment Period, Dec. 30, 2024 to Jan. 29, 2025**

**(/calendar/event/271991)**

The department completed Missouri's progress report for the Second Regional Haze Planning Period, which demonstrates that Missouri's regional haze plan for the second planning period achieves...

Area of Focus: Air      Event Type: Public Notice/ Public Comment

Organization: Air Pollution Control Program

The department completed Missouri's progress report for the Second Regional Haze Planning Period, which demonstrates that Missouri's regional haze plan for the second planning period achieves established goals for visibility improvement and emissions reductions. The department invites the public to review and offer written comments on Missouri's progress report for the Second Regional Haze Planning Period until Jan. 29, 2025.

Written comments may be submitted by mail to Missouri Department of Natural resources, Air Pollution Control Program. ATTN: Air Quality Section Chief, P.O. Box 176, Jefferson City, MO 651102-0176 or by email to [apcpsip@dnr.mo.gov](mailto:apcpsip@dnr.mo.gov) (<mailto:apcpsip@dnr.mo.gov>). Comments

submitted by email are limited to 3 MB in size. Comments larger than 3 MB need to be submitted by mail to the address above or call **573-751-4817 (tel:5737514817)** to make other arrangements.

The Second Regional Haze Planning Period 2025 Progress Report addresses Missouri's requirements under 40 CFR 51.308(g), (h) and (i) for the federal Regional Haze Rule. The Regional Haze Rule, codified at 40 CFR part 51, Subpart P, Visibility Protection, is designed to reduce visibility impairment from anthropogenic air pollution in 156 mandatory Class 1 Federal areas. All states must submit progress reports between planning periods to provide updates on the implementation of measures in the states Regional Haze Plan for the applicable planning period.

Missouri has two Class 1 areas: Hercules-Glades Wilderness Area and Mingo National Wildlife Refuge. The progress report evaluates the status of control measures relied upon in Missouri's plan, provides emissions reductions and trends, quantifies visibility progress, identifies any impediments to progress, and assesses the strategy detailed in the plan.

### **Meeting or Hearing**

No public meeting or public hearing scheduled.

### **Event Documents**

- **Missouri State Implementation Plan Progress Report - 2025 Period Progress Report for the Second Regional Haze Planning Period (/document/missouri-state-implementation-plan-progress-report-2025-period-progress-report-second-regional-haze-planning-period)**

## **Location Information**

Statewide, MO

Statewide

## **Contact Information**

Air Quality Section Chief

**573-751-4817 (tel:5737514817)**

**apcpsip@dnr.mo.gov (mailto:apcpsip@dnr.mo.gov)**

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[Drinking Water Watch\(https://www.dnr.mo.gov/DWW/DNRLogin.jsp\)](https://www.dnr.mo.gov/DWW/DNRLogin.jsp)

[Katy Trail Advisory Map\(https://mostateparks.com/page/84206/katy-trail-state-park-advisory-map\)](https://mostateparks.com/page/84206/katy-trail-state-park-advisory-map)

[State Park and Historic Sites Status \(https://modnr.maps.arcgis.com/apps/webappviewer/index.html?id=0cc1b6513d6e407694aede7b7bdbde93\)](https://modnr.maps.arcgis.com/apps/webappviewer/index.html?id=0cc1b6513d6e407694aede7b7bdbde93)

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[Request an Audit/ Report an Audit Concern\(https://stateofmissouri.wufoo.com/forms/qit15xl03dsjz1/\)](https://stateofmissouri.wufoo.com/forms/qit15xl03dsjz1/)

[Submit Public Comments\(/public-notice-comments\)](#)

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## Morgan, Cheri

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**Sent:** Monday, December 30, 2024 10:41 AM  
**To:** Morgan, Cheri; Bloomer, Susan; Meyer, Maddie; Holden, Tisha; Connor, Matt; Adams, Thomas; Moore, Kyra; Bybee, Darcy; Sheeley, Andrew; Stevens, Jeffrey; Keeney, Jennifer; Jensen, Michelle; Hall, Stephen; Mauthe, Carol; Downs, Jerry; Quinn, Brian; Patterson, Connie; Eichelberger, Genny; Gilmore, David; Frazier, Sanny; Rice, Heidi; Kremer, Karen  
**Subject:** Courtesy Copy: Accepting Public Comments - Missouri's Progress Report for the Second Regional Haze Planning Period

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65102-0176 or by email to [apcpsip@dnr.mo.gov](mailto:apcpsip@dnr.mo.gov). Comments submitted by email are limit to 3 MB in size. Comments larger than 3 MB need to be submitted by mail to the address above or call 573-751-4817 to make other arrangements.

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## **2. Public Comments**

The air program did not receive any comments during the public comment period that ended on January 29, 2025.